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CONTENTS

DEGREES, EXAMINATIONS AND COURSES OF STUDY

PAGES
Degrees 3
Entrance Examination ... ... 3—18
B.A. Degree Examination ... ... 19—42
B.Sc. Degree Examination ... ... 43—50
B.Com. Degree Examination ... ... 51—57
Intermediate Examination in Engineering ... 58—66
B.E. Degree Examination ... ... 67—87
Certificate Course in Engineering (Third Year) ... 88—90
B.T. Degree Examination (Post-Graduate Course) ... 91
M.A. Degree Examination in English ... ... 92—94
M A. Degree Examination in History, Economics and Political Science ... ... 95—99
M.A. Degree Examination in Philosophy 100–101
M.A. Degree Examination in Sanskrit 102–104

TEXT-BOOKS AND BOOKS RECOMMENDED FOR STUDY

Entrance Examination, 1921 105–107
B.A. Degree Examinations, 1921, 1922 and 1923 ... 108–131
B.Sc. Degree Examinations, 1921 and 1922 ... 132–133
B.Com. Degree Examinations, 1921 and 1922 ... 134
M.A. Degree Examination in English, 1921 ... 135–136
M.A. Degree Examinations in Sanskrit, 1921 and 1922... 137–140
M.A. Degree Examination in Philosophy ... 141–145

Degrees, Examinations, Courses of Study and Text-Books

Degrees

(*Vide* Ordinance 58)

The University now confers the following degrees :—

Bachelor of Arts (B.A.)
Bachelor of Science (B.Sc.)
Bachelor of Commerce (B.Com.)
Bachelor of Engineering (B.E.)
Bachelor of Teaching (B.T.)
Master of Arts (M.A.)

Examinations

University Entrance Examination

Conditions of admission

(*Vide* Ordinance 56)

Courses of study—(general)

(Ordinance 57)

I. English—

II. A Second Language (Kannada, Telugu, Tamil, Sanskrit, Hindustani, Persian or French). When a student selects Sanskrit or Persian as one of his optional subjects, he shall be required to select for his Second Language a language other than Sanskrit or Persian.

III. One of the following groups of subjects:—

(*a*) Physics, Chemistry, and Mathematics *or* Natural Science.

(*b*) History, Logic, and Sanskrit *or* Persian *or* Elementary Economics.

Courses of study—(detailed)

(Ordinance 68 [*a*])

A. ENGLISH

(*a*) *Composition* :—

The elementary principles and methods of composition with exercises—

(i) in condensing the subject matter of portions of prose or poetry; and

(ii) in writing single paragraphs, narrative, descriptive, expository, on topics suggested by the books read or subjects of common knowledge to High School students; and

(iii) in writing complete essays of several paragraphs.

(*b*) *Literature* :—

(i) Detailed study—
  Poetry: simple narrative or lyric.
  Prose: essays or short biography.
(ii) Non-detailed study—
  Two or three books: Greek stories, fiction, popular history or science, short biography or essays.

B. SECOND LANGUAGE

(*a*) *Kannada*

(*a*) Text-books in modern Kannada Poetry and Prose.
(*b*) Composition on general subjects.

(*b*) *Telugu*

(*a*) Text-books.
(*b*) Composition on general subjects.

(*c*) *Tamil*

(*a*) Text-books.
(*b*) Composition on general subjects.

(*d*) *Sanskrit*

(*a*) Detailed study of simple works prescribed from year to year.

(*b*) Elements of Practical Grammar.
(*c*) Translation from Sanskrit into English and *vice versa.*

(*e*) *Hindustani*

(*a*) Text-books.
(*b*) Composition on general subjects.

(*f*) *Persian*

(*a*) Detailed study of simple works prescribed from year to year.
(*b*) Elements of Persian Grammar.
(*c*) Translation from Persian into English and *vice versa.*

(*g*) *French*

(*a*) Text-books and Grammar.
(*b*) Translation.

C. OPTIONAL SUBJECTS

(a) Mathematics

Candidates will be required to be acquainted with the use of mathematical tables.

(1) *Algebra*

Algebraical laws and principles and their applications. Ratio and proportion. Theory of indices. Simple surds. Theory of equations and expressions of the second degree. Simultaneous equations of the second degree in two unknowns. The three progressions. Interest and annuities.

(2) *Plane Trigonometry*

Measurement of angles. Trigonometrical functions and their relations to one another. Simple equations. Addition and multiplication formulæ. Solution of triangles.

(*N.B.*—Only a general outline of the subject is expected.)

(3) *Geometry*

(i) Theory

Ratio and proportion. Similar figures. Properties of triangles and circles. Easy deductions.

Ratio and Proportion.—Definition and elementary theorems connecting the antecedents and consequents.

A given straight line can be divided internally in a given ratio at one, and only one, point: and externally at one, and only one, point.

A straight line drawn parallel to one side of triangle cuts the other two sides, or those sides produced, proportionally; and the converse.

If the vertical angle of a triangle is bisected internally or externally, the bisector divides the base internally or externally into segments which have the same ratio as the other sides of the triangle; and the converse.

In equal circles, angles, whether at the centres or circumferences, have the same ratio as the arcs on which they stand.

Triangles and parallelograms of equal altitude are to one another as their bases.

If two triangles have one angle of the one equal to one angle of the other, their areas are proportional to the rectangles contained by the sides about the equal angles. Similarly for parallelograms having one angle of the one equal to one angle of the other.

Similar figures.—If two triangles are equiangular their corresponding sides are proportional; and the converse.

If two triangles have one angle of the one equal to one angle of the other and the sides about these equal angles proportional, the triangles are similar.

Two triangles are similar, if the sides of the one are respectively parallel or perpendicular to the sides of the other.

If two triangles have two sides of the one proportional to two sides of the other, and an angle in each opposite one corresponding pair of these sides equal, the angles opposite the other pair are either equal or supplementary.

If from the right angle A of a right-angled triangle ABC, AD is drawn perpendicular to BC, then (1) AD is the mean proportional between BD and DC, (2) BA is the mean proportional between BD and BC, and (3) CA is a mean proportional between CB and CD.

If two triangles are similar, their corresponding lines (such as medians, altitudes, inradii) are to one another in the ratio of their corresponding sides.

Similar triangles are to one another as the squares on their corresponding sides.

Two similar polygons can be divided into the same number of triangles similar to each other and similarly placed; and the converse.

The perimeters of two similar polygons are to each other as any corresponding sides.

Areas of similar polygons are proportional to the squares on corresponding sides.

Properties of Triangles.—The three medians of a triangle meet in a point, and this point is a point of trisection of each median, and also of the line joining the circumcentre to the orthocentre.

If D is a point in the side BC of a triangle ABC such that $BD = 1/n\ BC$, then $(n-1)\ AB^2 + AC^2 = n.\ AD^2 + (1-1/n)\ BC^2$.

The perpendiculars from the vertices of a triangle on the opposite sides meet in a point, and the distance of each vertex from the orthocentre is twice the perpendicular distance of the circumcentre from the side opposite to that vertex.

The circle through the middle points of the sides of a triangle passes also through the feet of the perpendiculars of the triangle and through the middle points of the three lines joining the orthocentre to the vertices of the triangle.

If a perpendicular drawn from the vertex to the base of a triangle is produced to meet the circumcircle, then the distance of this point of intersection from the base is equal to the distance of the orthocentre of the triangle from the base.

The feet of the perpendiculars drawn on the sides of a triangle from any point P on the circumcircle of that triangle are collinear.

If the vertical angle of a triangle is bisected by a straight line which cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base together with the square on the straight line which bisects the angle.

If from the vertical angle of a triangle a straight line is drawn perpendicular to the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the perpendicular and the diameter of the circle described about the triangle.

Properties of Circles.—The locus of the points of intersection of tangents drawn at the extremities of chords of a circle which pass through a fixed point, is a straight line.

If the polar of A passes through B, then the polar of B passes through A.

If P and Q are any two points in the plane of a circle whose centre is O, then OP bears to OQ the same ratio as the perpendicular from P on the polar of Q bears to the perpendicular from Q on the polar of P.

The locus of points from which the tangents to two given co-planar circles are equal is a line perpendicular to the line of centres.

In two circles, if any two parallel radii are drawn (one in each circle), the straight line joining their extremities cuts the line of centres in one or other of two fixed points (called centres of similitude).

If through a centre of similitude S of two circles, a line is drawn cutting the circles, radii to a pair of corresponding points are parallel.

If through a centre of similitude of two circles, a line is drawn cutting the circles, then the rectangle under the distances of one pair of non-corresponding points from S is equal to the rectangle under the distances of the other pair of non-corresponding points from S; and each of these rectangles is constant.

In a cyclic quadrilateral the rectangle contained by the diagonals is equal to the sum of the rectangles contained by the opposite sides.

(ii) Practical Work

Construction of the circumscribed, inscribed and escribed circles of triangles and regular polygons. Construction of triangles and quadrilaterals from given data, and their division in any given ratio. Areas of polygons. Construction of similar figures.

(b) Physics

Mechanics.—Units of length, mass and time. Position, change of position, rate of change of position, rate of change of speed in a straight line. Force, energy, work and power. The vector parallelogram, simple systems of parallel forces, centre of gravity. Simple machines. The simple pendulum treated experimentally, gravitational acceleration.

Hydrostatics.—Fluid pressure. Principle of Archimedes with simple applications. Determination of specific gravity. Pressure of a gas and its measurement; atmospheric pressure Boyle's Law. Simple piston pumps.

Heat.—Distinction between quantity of heat and temperature. Measurement of temperature by liquid-in-glass thermometers. Expansion. Specific heat and its determination. Fusion, evaporation, latent heat.

Magnetism.—Magnets and magnet poles. Law of inverse squares. Shape of fields due to straight and bent magnets. Magnetic compass. Simpler properties of iron and steel.

Electricity.—Simple voltaic cell. Electric current. Electrolysis and Faraday's Laws. Magnetic field of current. Field at centre of circular coil; tangent galvanometer. Electromagnets. Action of magnetic field on electric current. Suspended coil galvanometer. Heating effect of current; Joule's Law. Electromotive force. Resistance: Ohm's Law. Measurement of electromotive force and of resistance. Wheatstone's Bridge: potentiometer. Description of simple applications, such as telegraph, bells, lamps and direct current motors.

(c) Chemistry

Objects of study of Chemistry: to ascertain composition of materials; to investigate changes in composition; and from the foregoing to deduce general laws.

Mixtures and compounds; methods of resolving mixtures into their constituents; examples: sand and sugar by solution and filtration; salt and water by evaporation; alcohol and water by distillation: sand and salammoniac by sublimation; sulphur and iron magnetically: copper sulphate and water by crystallisation.

Chemical change: combination illustrated by sulphur and iron, sulphur and oxygen, candle and oxygen, quicklime and water. Decomposition illustrated by heating sugar, action of sodium on water, heating mercuric oxide, heating lead nitrate. Replacement illustrated by zinc and sulphuric acid, zinc and copper sulphate. Double decomposition illustrated by common salt and silver nitrate.

Ultimate products of decomposition: elements: number of elements known. Examples of commonly occurring elements: oxygen, nitrogen, silver, gold, iron, sulphur, carbon.

Combination consists in union of elements with elements, elements with compounds, or compounds with compounds, a new compound being formed in every case. Burning as a special case of combination. Burning of phosphorus, of sulphur, of magnesium, and of a candle.

Rusting of iron, oxidation of mercury and of copper. Products of burning or oxidation always heavier than material burnt or oxidised. Water and carbonic acid as products of combustion.

Composition of air as deduced from experiments on combustion. Reasons for regarding air as a mixture. The active and inactive constituents of air.

Oxygen: discovery. Preparation. Properties. Comparison of combustion in oxygen and air. Character of oxygen compounds as illustrated by oxides of phosphorus, sodium and mercury. Meaning of acids and bases; their characteristic properties.

Hydrogen: preparation from sodium and water: from water by electrical decomposition: from acids by the action of metals such as iron and zinc; from caustic alkalies by the action of aluminium or zinc. Properties. Water a compound of hydrogen and oxygen.

Composition of compounds determined: (1) by analysis, (2) by synthesis, illustrated by the case of water. Methods of carrying out these processes. Composition of water by volume and by weight. Guy Lussac's Law of Volumes Constancy of composition of water. This constancy of composition characteristic of all compounds. Law of definite proportions. Properties of water, solvent action on solids and gases, illustrated by solutions of copper sulphate, sugar, air and carbon dioxide. Nature of rain water, sea water, spring and river water. Purification of water: distillation. Crystals and crystallisation: water of crystallisation. Extraction of salt from sea water.

Nitrogen: preparation from air. Properties.

Nitric acid: preparation from nitre: properties. Formation and nature of salts. Nitrous oxide, nitric oxide, and nitrogen peroxide

Ammonia: preparation; properties: power of neutralising acids; solubility. Ammonium chloride and ammonium nitrate and their behaviour on heating.

Carbon: occurrence and different forms. Properties and uses. When burnt forms carbonic dioxide. This gas always formed when carbon compounds are burnt; hence wood, candles, oil, all contain carbon. Preparation and properties of carbon dioxide; action on lime water; product of respiration of animals and plants.

Sulphur: occurrence and different forms; properties; when burnt forms sulphur dioxide.

Sulphuric acid: properties and uses.

Chlorine and hydrochloric acid: preparation of hydrochloric acid from common salt; properties of the gas and of its solution in water. Chlorine from hydrochloric acid and manganese dioxide; combination of chlorine with hydrogen and with sodium to form hydrochloric acid and common salt. Bleaching action.

Phosphorus: different forms; their properties and uses.

Silicon: a constituent of sand. Occurrence of silica free and in combination.

General properties of non-metals and metals.

Sodium and potassium: occurrence and properties. Common salt, sodium carbonate and bicarbonate, caustic soda, potassium nitrate, potassium chlorate, caustic potash.

Calcium: occurrence as carbonate. Production of lime from limestone; properties of lime; mortars. Calcium sulphate: gypsum and plaster of Paris; calcium chloride; bleaching powder.

Occurrence, general method of preparation, properties and uses of zinc, iron, lead, silver, mercury, copper and aluminium. Properties of their more important compounds.

Practical Work

The practical course will aim chiefly at developing facility in the ordinary methods of manipulation, and as regards subject matter will follow the course given in Smith's "Laboratory Outline of Elementary Chemistry," omitting the portion dealing with ionisation.

(d) Natural Science

ELEMENTARY BOTANY

(NOTE.—The work will be chiefly practical, if necessary with the aid of a simple lens. There will be no detailed reference to Histology except where necessary to understand the elements of plant physiology. The candidate will be required to draw and describe parts of plants.)

1. *External Morphology and Physiology.*—The root, stem, bud, leaf, flower, fruit and seed; their component parts and their chief modifications and functions treated practically.

2. *Systematic Botany.*—The general principles of classification and the characteristics of the following natural orders viewed from an elementary standpoint:—

Capparideæ, Malvaceæ, Rhamneæ, Leguminosæ, Myrtaceæ, Umbelliferæ, Rubiaceæ, Compositæ, Apocynaceæ, Asclepiadaceæ, Solanaceæ, Acanthaceæ, Labiatæ, Euphorbiaceæ, Palmeæ, Scitamineæ and Gramineæ.

OUTLINES OF HUMAN PHYSIOLOGY

(NOTE.—The subject will be treated from a practical standpoint, with, as far as possible, demonstrations on a small mammal, such as the rabbit.)

The leading facts concerning the chief organs of the body and the blood; the human skeleton; the principal joints and the action of the muscles; the nature and function of blood; the position and arrangement of viscera in man, circulatory and respiratory organs; food, its nature. digestion and absorption; the principal glands and their functions; waste, its nature and mode of elimination; temperature of the body and its maintenance; the chief functions of the central nervous system, nerves and sensory organs.

ELEMENTS OF ZOOLOGY

A brief consideration of the external characters of the following animals:—

Earthworm, spider, scorpion, cockroach, beetle, butterfly, caterpillar, fish, frog, lizard, snake, bird, bat, cat, rabbit, cow and horse.

(These animals will be studied in such a way as to bring out the relation which their form bears to their habits and mode of life.)

(e) History

History of England.

(f) Economics

Recent Economic History of England.

[For the guidance of the Lecturers of the Collegiate High Schools]

The following are the details of the Course of Study under "Recent Economic History of England" for the Entrance Examination:

I. *Introductory*—
  (*a*) 1. Economic History, its nature and scope and importance.
    2. Stages in the economic development of England; main features of each stage.
    3. The latest stage and its importance.
  (*b*) Economic conditions in England on the eve of the Industrial Revolution.

II. *The Industrial and Agrarian Revolutions*
  (*a*) The Industrial Revolution—
    1. The great inventions and application of power.
    2. Effects, economic, social and political.
  (*b*) The Agrarian Revolution—
    1. Pressure for, and progress of, enclosures.
    2. Effects, economic, social and political.

III. *Later Developments*

- (*a*) Industry—
  1. Main industries of the country.
  2. Changes in structure and organisation; joint-stock companies, industrial towns; division into processes: concentration.
  3. Formation of working class organisations: trades unions, friendly societies, co-operative societies.
- (*b*) Agriculture—
  Abolition of Corn Laws; depression and revival; importation of foreign corn; revival of small scale farming.
- (*c*) Commerce—
  1. Improved means of communication: roads and canals; railways; steam navigation.
  2. Wider markets and change in character of exports and imports.
  3. Free trade; abolition of the navigation laws.
- (*d*) Currency and Banking—
  State of British Currency at the close of the 18th century; the Bank of England; suspension of cash payments; the Bank Charter Act; use of cheques as currency.
- (*e*) The State in Relation to the Economic Life of the people—
  1. National finance.
  2. Factory legislation.
  3. Poor relief.
  4. Commercial policy.

In connection with the above syllabus it is recommended that either Chapters 13 and 15 to 19 in Townsend Warner's "Landmarks in English Industrial History," or Chapters 17 to 29 in Inness' "England's

Industrial Development," be used by the students; while the Lecturer should use the following books:—

(1) Cunningham: "Growth of English Industry and Commerce," Vol. II, Part II (Cambridge University Press).
(2) Cressy: "An Outline of Industrial History" (Macmillan).
(3) Perris: "The Industrial History of Modern England" (Kegan Paul).
(4) Toynbee: "Industrial Revolution" (Longmans).

(g) Logic and Scientific Method

Terms, their distinctions; formal division and definition; propositions; immediate inference; syllogism; mood and figure; reduction; hypothetical syllogism; disjunctive syllogism.

Text-book prescribed.—

"Introductory Text-book of Logic" by Mellone (Passages marked with an asterisk and sections 3-6 in Chapter IV, Part IV ot Chapter V, Chapters VIII and IX and Chapter XI should be omitted. So far as the matter in small type is concerned the teachers in Logic should select what they consider important).

Books to be consulted.—

(1) The Elements of Deductive Logic by Dr. Prabhu Dutt Sastry.

(2) An Introductory Logic by Creighton.

(h) Sanskrit

(*a*) Detailed study of books—both in prose and verse—prescribed from year to year.

(*b*) The elements of Sanskrit grammar and prosody, as in Macdonell's "Sanskrit Grammar for Beginners" or Kale's "Smaller Sanskrit Grammar"; and

(*c*) Translation of unprepared passages from Sanskrit into English and *vice versa.*

(i) Persian

Detailed study of books—both in prose and verse—prescribed from year to year.

Scheme of Examination: Ordinance 91 (*a*).

1.	English : Texts	 1	paper of	3	hours
	,, Composition	. . 1	,,	3	,,
2.	*Second Language—*				
(i)	Kannada : Texts	 1	,,	2	,,
	,, Composition	 1	,,	2	,,
(ii)	Telugu : Texts	 1	,,	2	,,
	,, Composition	 1	,,	2	,,
(iii)	Tamil : Texts	 1	,,	2	,,
	,, Composition	 1	,,	2	,,
(iv)	Sanskrit : Texts....	 1	,,	2	,,
	,, Translation	... 1	,,	2	,,
(v)	Hindustani : Texts	 1	,,	2	,,
	,, Composition	 1	,,	2	,,
(vi)	Persian : Texts	 1	,,	2	,,
	,, Translation	 1	,,	2	,,
(vii)	French : Texts	 1	,,	2	,,
	,, Translation	 1	,,	2	,,
3.	*Optional Subjects—*				
(i)	Mathematics :—Algebra and Trigonometry	 1	,,	2	,,
	,, Geometry	 1	,,	2	,,
(ii)	Physics ...	 2	papers of	2	hours each
(iii)	Chemistry	 2	,,	2	,,
(iv)	Natural Science : Zoology	1	paper of	2	hours
	,, Botany	 1	,,	2	,,

(v)	History	.. 2 papers of 2 hours each
(vi)	Economic History of England	.... 2 ,, 2 ,,
(vii)	Logic	.... 2 ,, 2 ,,
(viii)	Sanskrit: Texts	.... 1 paper of 2 hours
	,, Translation	... 1 ,, 2 ,,
(ix)	Persian: Texts....	.... 1 ,, 2 ,,
	,, Translation	.... 1 ,, 2 ,,

Time-table for the Examination

Day	*Time*	*Subject*	*Max. marks*
1st	10 a.m. to 1 p.m.	English: Composition	120
	2 p.m. to 4 p.m.	Second Language: Texts*	100
2nd	10 a.m. to 1 p.m.	English: Texts	80
	2 p.m. to 4 p.m.	Second Language: Composition or Translation	100
3rd	10 a.m. to 12 noon	Physics I History I	100
	2 p.m. to 4 p.m.	Physics II History II	100
4th	10 a.m. to 12 noon	Chemistry I Logic I	100
	2 p.m. to 4 p.m.	Chemistry II Logic II	100
5th	10 a.m. to 12 noon	Mathematics (Algebra and Trigonometry) Natural Science (Zoology) Economic History of England I Sanskrit and Persian: Texts	100

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* The first paper in Telugu will consist of questions on the prescribed texts and on the Grammar, Prosody, Rhetoric and Idiom fo the Language.

Day	*Time*	*Subject*	*Max. marks*
5th	2 p.m. to 4 p.m.	Mathematics (Geometry, Theor. and Prac.) Natural Science (Botany) Economic History of England II Sanskrit and Persian: Translation	100

Minima for Pass

(*Vide* Ordinance 74)

Publication of Results

(*Vide* Ordinance 77)

B. A. Degree Examination

* *Conditions of admission*

(*Vide* Ordinance 55)

Courses of study—(general): Ordinance 63.

I. English.

II. A Second Language (Kannada, Telugu, Tamil, Sanskrit, Hindustani, Persian or French). When a student selects Sanskrit or Persian as one of his optional subjects, he shall be required to select for his Second Language a language other than Sanskrit or Persian.

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* No one will be allowed to enter for the First year Certificate or for the B.A. Degree Examination as a private candidate, unless such a candidate has once appeared already at this Examination.

III. A. (*a*) In the first year,

(i) Mathematics, Physics, and Chemistry.

Or

(ii) Zoology, Geology, and Botany.

(*b*) In the second and third years, any two of the subjects studied in the first year.

Or,

B. *Two* of the following subjects :—

- (*a*) History.
- (*b*) Economics and Political Science.
- (*c*) Philosophy, Group I.
- (*d*) Philosophy, Group II.
- (*e*) Sanskrit, Group I—Sahitya (Classical Literature and Criticism)..
- (*f*) Sanskrit, Group II[illegible]dic Studies.
- (*g*) Do [illegible] Darsanas (Philosophical Literature).
- (*h*) Persian.

Note.—Persian may not be taken in conjunction with any of subjects (*e*), (*f*), and (*g*).

Courses of study—(detailed): Ordinance 68 (*b*) and (*c*).

I. ENGLISH

(*a*) Text-books for detailed and non-detailed study.

(*b*) History and principles of literature with reference to prescribed books.

(*c*) Principles of style and elocution.

(*d*) Composition.

II. SECOND LANGUAGE

(*a*) *Kannada*

(1) *Literature* :—

Text-books from the three periods.

(2) *Language :—*

Elementary knowledge of the grammar of old Kannada, and of rhetoric and prosody; and the main outlines of the history of Kannada language and literature. No text-books will be used, but lectures will be given and an elementary handbook covering the whole field will be prepared.

(3) *Composition and Translation :—*

General principles of composition and style and for translation. exercises to be chosen from good passages in English poetry and prose.

OSMANIA UNIVERSITY

(*b*) *Telugu*

(1) Literature.
(2) Language.
(3) Composition and translation.

(*c*) *Tamil*

(1) Literature.
(2) Language.
(3) Composition and translation.

(*d*) *Sanskrit*

(*a*) The detailed study of books prescribed from time to time.

(*b*) Grammar and prosody, as in Macdonell's "Sanskrit Grammar for beginners" or Kale's "Smaller Sanskrit Grammar."

(*c*) The History of literature, as in Macdonell's "Sanskrit Literature" (Chapters X—XIV).

(*d*) Translation from English into Sanskrit, and *vice versa.*

(*e*) *Hindustani*

(1) Literature.
(2) Language.
(3) Composition and translation.

(*f*) *Persian*

(1) Prescribed books and grammar.
(2) Translation.

(*g*) *French*

(1) Prescribed books and grammar.
(2) Composition and translation.

III. OPTIONAL SUBJECTS

A. (a) Mathematics

First year

(*a*) Algebra,
(*b*) Trigonometry,
(*c*) Geometry, and
(*d*) Analytical geometry.

(*a*) *Algebra*

Permutations and combinations. Convergence and divergence of series. The binomial theorem, any rational index. Indeterminate equations of the first degree.

(*b*) *Trigonometry*

Division formulæ. Properties of triangles and of the circles connected with them. Heights and distances. Solution of equations.

(*c*) *Geometry*

(i) Theory

Concurrence and Collinearity. Loci. Elementary Maxima and Minima.

The fundamental properties of the parabola.

Concurrence and Collinearity.—The use of signs as applied to lines, angles and areas. If two parallel lines are cut by three or more concurrent transversals, the corresponding segments are proportional; and the converse.

If X, Y, Z are points in the sides BC, CA, AB of a triangle ABC, such that the perpendiculars to those sides at these points are concurrent, then

$$(BX^2-XC^2)+(CY^2-YA^2)+(AZ^2-ZB^2)=0;$$
$$or\ BX^2+CY^2+AZ^2=CX^2+BZ^2+AY^2,$$

and the converse.

If any transversal meets the sides BC, CA AB of a triangle in D, E, F, then

AF. BD. CE=AE. CD. BF;

and conversely if three points D. E, F, taken on the sides BC, CA, AB of a triangle, satisfy the relation AF. BD. CE=AE. CD. BF, then D, E, F, are collinear.

If the lines joining any point to the vertices A, B, C of a triangle meet the opposite sides in D, E, F;

then AF. BD. CE.=FB. DC. EA;

and conversely, if three points D, E, F, taken on the sides BC. CA. AB of a triangle, satisfy the relation AF. BD. CE=FB. DC. EA, then AD, BE, CF are concurrent.

If two unequal similar figures are similarly placed, the lines joining the vertices of one to the corresponding vertices of the other are concurrent.

Loci.—If from a fixed point O a variable line is drawn, and in it points P, Q are taken, so that the ratio of OP to OQ is constant then (1) if P moves along a straight line, the locus of Q is a parallel straight line; (2) if P moves along the circumference of a circle, the locus of Q is a circle.

The locus of a point which is such that the rectangle under its distances from the equal sides of an isosceles triangle is equal to the square on its distance from the third side, is the circle which touches the equal sides at the extremities of the third side.

If A, B are fixed points, and P a variable point such that the ratio of PA to PB is one of constant inequality, then the locus of P is a circle.

Given the base and vertical angle of a triangle, find the locus of its (1) incentre, (2) orthocentre, (3) centroid, (4) excentres.

If a triangle ABC of given species has one corner A fixed, another B always on a fixed line or circle, then the locus of C will be a line or circle.

Elementary Maxima and Minima.—When two sides of a triangle are given in length, the area of the triangle is greatest when they are placed at right angles.

The maximum triangle which can be inscribed in a given segment of a circle is that formed by joining the middle point of its arc to the extremities of the chord

If A, B are two fixed points, and XY a fixed line; then for that point P in XY at which AP, BP make equal angles with XY.

(1) $AP + PB$ is minimum, if A, B are on the same side of XY.

(2) $AP \sim BP$ is maximum, if A, B are on opposite sides of XY.

If A, B are fixed points and P any point in a fixed line, the angle APB will be maximum, when the circle APB touches the fixed line.

Of all triangles having the same base and equal areas, the isosceles triangle has the minimum perimeter.

The maximum of isoperimetric triangles on the same base is the one whose other two sides are equal.

Of all polygons having all sides given but one, the maximum can be inscribed in a semi-circle having the undetermined side as diameter.

Of all isoperimetric polygons of the same number of sides, the equilateral is the maximum.

Of all isoperimetric polygons of the same number of sides, the maximum one is equilateral.

If P is any point in a given straight line AB, AP, PB, is maximum and $AP^2 + PB^2$ is minimum when P is the middle point of AB; of all rectangles, of given area, the square has the minimum perimeter.

The maximum parallelogram which can be inscribed in a triangle by drawing parallels to two of its sides, is that formed by drawing the parallels from the middle point of the third side.

(ii) Practical Work

Simple cases of orthogonal projection.

(*d*) *Analytical Geometry*

The point, the straight line and the circle.

Second and third years

(*a*) Algebra,
(*b*) Trigonometry,
(*c*) Geometry,
(*d*) Infinitesimal calculus,
(*e*) Dynamics, and
(*f*) Astronomy.

(*a*) *Algebra*

Exponential and logarithmic series. Inequalities. Partial fractions. Elementary methods of summation of series. Theory of equations and elementary properties of determinants. (As in C. Smith's "Higher Algebra.")

(*b*) *Trigonometry*

De Moivre's theorem and its simple applications.

(*c*) *Geometry*

Pure Geometry

Harmonic properties of the quadrilateral. Coaxal circles. Inversion. The fundamental properties of the conic sections. The geometry of the line, the plane, and the sphere.

Analytical Geometry

Elementary plane analytical geometry as applied to conic sections. (The general equation of the second degree, rectangular axes.) The polar equation of a conic referred to the focus as origin.

(*d*) *Infinitesimal Calculus*

As in A. E. H. Love's "The Elements of Differential and Integral Calculus" (Cambridge University Press.)

(*e*) *Dynamics*

As in Hick's "Elementary Dynamics."

(*f*) *Astronomy*

As in Parker's "Elements of Astronomy."

(b) Physics

First year

The course prescribed for the Entrance Class and, in addition, the following :—

Sound.—Production and propagation. Velocity of sound in gases. Reflection: echoes. Loudness and pitch of musical notes. Longitudinal vibrations of air: transverse vibrations of strings.

Heat.—Expansion of gases. Charles' Law. Gas thermometers. Vapour pressure. Conduction, convection, and radiation. Heat and work; mechanical equivalent of heat. Principle of steam engine.

Light.—Rectilinear propagation of light, shadows. Laws of reflection and refraction. Lenses and mirrors, images. Telescope and microscope. Dispersion. Production of a pure spectrum. Use of simple spectrometer.

Electrostatics.—Production of electric charges by friction. Conductors and non-conductors. Gold leaf electroscope. Electric induction. Influence machines. Faraday's ice-pail experiment. Inverse square law. Elementary notions of potential.

Second and third years

In alternate years the two following groups of subjects will be lectured on—

Properties of matter, sound and heat.
Light, electricity and magnetism.

Properties of Matter.—Gravitation, determination of g. Elasticity. Compressibility of gases liquids and solids Rigidity. Strain due to longitudinal pull. Young's Modulus. Simple twisting of shafts and wires treated experimentally. Diffusion. Osmosis. Viscosity. Surface tension. Simple elements of the kinetic theory.

Sound.—Simple theory of wave motion. Interference. Diffraction. Measurement of wave lengths and pitch. Vibrations of strings, rods and gas columns. Resonance.

Heat.—Thermometry. Calorimetry. Conduction, convection and radiation. Change of state. Simple thermodynamics.

Light.—Simple physical optics and geometrical optics.

Electricity.—Elementary electrostatics treated quantitatively. Resistance and its measurement. Electromotive force and its measurement. Electrolysis. Thermoelectricity. Electromagnetic induction. The theory and practical use of the commoner electrical apparatus.

Magnetism.—Force on magnet in a magnetic field. Measurement of field strength. Terrestrial magnetism and its measurement.

(c) Chemistry

First year

The matter prescribed in the Syllabus for the University Entrance Course and, in addition, the following :—

The classification of the elements. Laws of chemical combination. Atomic theory, symbols and formulæ. Avogadro's hypothesis. Atomic and molecular weights. Chemical equations. Calculations.

The methods of preparation and the properties of the following elements and their principal compounds :—Hydrogen, sodium, potassium, copper, silver, magnesium, calcium, barium, zinc, mercury, boron, aluminium, carbon, silicon, tin, lead, nitrogen, phosphorus, arsenic, oxygen, sulphur, fluorine, chlorine, bromine, iodine, iron.

Second and third years

The descriptive portion will include the elements and their compounds studied in detail from the standpoint of the periodic classification, omitting the rare metals and the chemistry of carbon compounds.

THEORETICAL AND PHYSICAL CHEMISTRY

Methods of determining equivalent, atomic, and molecular weights; the atomic theory; valency; the properties of gases; transition from gaseous to liquid state. vapour pressure and boiling point; solutions and solubility, osmotic pressure; theory of electrolytic dissociation; electrolysis; relation of chemical energy to electrical energy and to heat; the law of mass-action; speed of chemical change; catalysis; relation of physical properties to chemical constitution.

Practical Course

Qualitative analysis of simple salts and of mixtures containing not more than two bases and two acids; volumetric analysis; inorganic preparations.

(d) Zoology

First year

A study of the main types illustrative of the habits, structure and life-history of the following groups:—

Protozoa, Cœlenterata, Annelida, Echinodermata, Arthropoda, Mollusca and Vertebrata. A practical study of these types, where necessary with the help of the microscope, together with dissection of the following:—Cockroach, frog and rabbit.

Second and third years

The first year course treated more fully, including a knowledge of the classification and affinities of the groups included therein, together with the following groups:—

Porifera, Platyhelmia, Nematoda, Rotifera, Polyzoa, Sipunculoidea. Brachiopoda, Chaetognatha. Enteropneusta, Tunicata and Cephalochorda.

Candidates will be expected to possess a knowledge of the Vertebrate fauna of S. India and the geographical distribution of the more interesting groups of the Chordata.

The practical work will include for dissection the following types, in addition to the list for the first year course:—

Earthworm, leech, prawn. crab and centipede (external characters only), scorpion, fresh water mussel, ampullaria, a selachian and pigeon. A jelly. fish, a sea urchin or a holothurian, sepia and a simple ascedian, if the types can be obtained.

Candidates will also be tested practically by being required to describe and identify specimens or preparations (both microscopical and skeletal) of any of the principal types included for study.

(e) Geology

First year

PHYSIOGRAPHY

The Earth as a planet, its general relations to the other members of the solar system. hypotheses as to the origin of the earth; form, size and density of the earth; its movements and their effects.

The Atmosphere, its composition, height, density, pressure, temperature. moisture and movements; weather, refraction, twilight and aurora-borealis.

The Hydrosphere, its composition, extent and distribution, depth, temperature and movements.

The Lithosphere, the chief constituents of the earth's crust, the general characters and mode of occurrence of igneous and sedimentary rocks, condition of the interior of the earth.

Agents of geological change, the hypogene and epigene agents of geological change, manner and results of their action, especially as influencing earth-sculpture, the destruction, construction, and gradual evolution of the crust of the earth and of its surface features.

Fossils, the main conditions favourable for their formation and preservation and their value as interpreters of the past history of the earth.

Climates, their causes and distribution; glacial epochs.

Simple facts about the geographical and geological distribution of the chief types of plant and animal life. Antiquity of man. Views as to the age of the earth's crust.

Second and third years

MINERALOGY AND CRYSTALLOGRAPHY

Symmetry; lines, planes and axes of symmetry; laws of Crystallography; the common holohedral, hemihedral and hemimorphic crystal forms and combinations under each of the six crystal systems; the more important types of twins and twinning; drawing of the more important crystal forms; systems of crystal notation, use of the contact Goniometer.

The principal physical properties of minerals which aid in the recognition of the various mineral species.

Isomorphism, paramorphism, pseudomorphism and dimorphism.

The chief characteristics of all the more abundant minerals, including both those which are of geological interest and those of commercial value, their modes of occurrence and uses.

The practical determination of the chief physical and chemical properties of the commoner ores and minerals, including the use of the blowpipe.

PETROLOGY

The classification and distribution of rocks, and the composition, structure, texture, origin and mode of occurrence of all the more important types and their metamorphic and altered forms.

Contact and Regional Metamorphism.

The microscopic and microscopic examination of rocks, including the determination of the simpler optical characters of the chief rock-forming minerals in parallel polarised light. Preparation of diagrams or sketches to represent features observed in rock sections under the microscope. Construction and use of a simple petrological microscope.

Structural and Field Geology

The more important lithological and structural features of rocks, their origin or formation; structure of mineral veins. Diagrammatic sketches of the above.

Construction and interpretation of geological maps and sections. Tracing of outcrops. Simple problems in structural geology.

Stratigraphy and Palaeontology

The chief petrological and palaeontological characters of the main geological divisions and their Indian representatives and the probable physical conditions under which they were formed.

Fossils, their nature and preservation. The main groups of vegetable and animal life and their distribution in time.

The characters, classification and distribution of the more important types of fossils—especially Indian; identification and sketching of fossils; causes for the imperfection of the geological record; the general succession of life as revealed thereby and the general evidence furnished in support of evolution; principles of correlation; homotaxis.

Practical Work

Geological excursions to parts in and outside Mysore for nearly a month. Determination of rocks by their micro-characters and of minerals by the blowpipe, microscopic and other methods. Drawing of crystal forms, fossils and microsections, construction and interpretation of geological maps and sections. Problems in structural geology.

(f) Botany

First year

Histology.—The microscopic structure of root, stem, leaves, and reproductive organs of phanerogamic groups. Study of the chief modifications in structure of the different organs. Reserve materials found in the various organs with simple tests for determining them.

Physiology.—Composition of plants and how the various chemical elements and compounds are taken up by them. Functions of the leaves treated in detail, including assimilation, respiration, transpiration and the movement of assimilated products. Functions of root and stem. Functions of reproductive organs including formation of seed and methods of seed dispersal. Parasitism and symbiosis.

NOTE :—This will be treated, as far as possible, experimentally, and the courses in Histology and Physiology will proceed side by side so as to correlate structure and function.

Second and third years

1. Principal characteristics of Gymnosperms, Lycopodinæ, Hepaticæ, Muscineæ, Filicinæ, Algæ, Fungi, and Bacteria.

2. Characteristics of the following Phanerogamic orders :—Anonaceæ, Menispermaceæ, Cruciferæ, Sterculiaceæ, Geraniaceæ, Rutaceæ, Meliaceæ, Sapindaceæ, Rosaceæ, Cucurbitaceæ Convolvulaceæ, Scrophularineæ, Verbenaceæ, Amaranthaceæ, Santalaceæ, Urticaceæ, Piperaceæ, Liliaceæ, Amaryllidaceæ, Orchidæ, Aroideæ, Cyperaceæ, in addition to the orders mentioned in the Entrance Course.

B. (a) History

First year

Outlines of Greek and Roman History.

Second and third years

(1) History of Europe (476—1878).
(2) History of India.

* (b) Economics and Political Science

First year

(1) The British Constitution.
(2) Indian Economic Conditions.

Second and third years

(1) Economics.
(2) Political Science.

* (c) Philosophy: Group I

First year

(1) Logic.
(2) Plato and Aristotle.

Second and third years

(1) Theory of Knowledge.
(2) History of Modern Philosophy
(3) A Prescribed Classic.
(4) Indian Philosophy.

(d) Philosophy: Group II

First year

(1) Ethics.
(2) Psychology.

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* Students who have passed the University Entrance Examination with Science as Optional Subjects will be admitted to the first year B.A. class (Philosophy and Economics Sections).

Second and third years

(1) History of Ethics.
(2) History of Modern Philosophy.
(3) Political Philosophy.
(4) Ethico-Political Classic.

NOTE.—In the case of candidates who select both the groups, a second prescribed classic in the History of Philosophy will be prescribed.

The course in the History of Modern Philosophy for the B.A. Examination will cover only the leading Philosophers, *viz.*, Descartes, Spinoza, Leibnitz, Locke, Berkeley, Hume, Kant, and Hegel.

(e) Sanskrit: Group I.—Sahitya (Classical Literature and Criticism)

(*a*) Selections in prose and poetry from epic and later classical literature.

(*b*) Two prescribed dramas.

The students will be expected to possess a knowledge of the elements of *Prakrit* Grammar and of Dramaturgy.

(*c*) General principles of Sanskrit poetics together with a prescribed classic on the subject.

(*d*) Grammar and History of the Sanskrit Language including the study of a select portion of the *Siddhanta-Kaumudi.*

(*e*) History of classical literature and criticism with special reference to books prescribed under (*a*), (*b*) and (*c*).

(*f*) Translation of unseen passages from Sanskrit into English and *vice versa.*

(f) Sanskrit: Group II.—Vedic Studies

(*a*) Selections representative of the several stages of Vedic literature :—*Mantra*, *Brahmana* and *Sutra*.

(*b*) Elements of Indo-Germanic philology and comparative grammar with special reference to Sanskrit, according to a syllabus.

(*c*) Vedic Grammar.

(*d*) History of Vedic literature with special reference to books prescribed under (*a*).

(*e*) Translation into English of simple unseen Vedic passages.

(g) Sanskrit: Group III.—Darsanas (Philosophical Literature)

(*a*) Selections representative of the earlier philosophical literature—*Upanishads* and *Epics.*

·(*b*) Selections representative of the *Vedanta* and other philosophical systems.

(*c*) Elements of *Tarka* according to a prescribed book like the *Tarkasangraha* with *Dipika.*

(*d*) History of Indian Philosophy with special reference to books prescribed under (*a*) and (*b*).

[The following is the old course of studies for the B.A. Degree Examination under Sanskrit (Optional).

(1) Text books—prescribed from time to time for detailed and non-detailed study.

(2) History of Sanskrit literature.

(3) Grammar and history of Sanskrit language.

(4) Translation.

The details of the course shall be as follows :—

i. (*a*) Detailed study of suitable selections prescribed from time to time from—

(1) *Mantras, Brahmanas* and *Sutras.*
(2) *Vyakarana, Alankara* and *Tarka.*

(*b*) Non-detailed study of simple selections prescribed from time to time from classical prose, poetry and drama.

ii. History of Sanskrit literature. A knowledge of the outlines of Ancient Indian history will be required.

Books recommended—

(1) Macdonell's "Sanskrit Literature."
(2) V. A. Smith's "Early History of India"

iii. Grammar and History of Sanskrit language—

Books recommended—

(1) Macdonell's "Sanskrit Grammar."
(2) Do "Vedic Grammar for Students."

iv. Translation of unseen passages from Sanskrit into English and *vice versa.*]

(h) Persian

(1) Detailed study of prescribed books.
(2) History of Persian literature.*
(3) Grammar and History of Persian language.
(4) Translation and composition.

A knowledge of Arabic grammar will be expected from the candidates.

Scheme of Examination: Ordinance 91 (*b* and *c*).

First Year Certificate Examination

I. ENGLISH

		Max. Marks
1. Composition	1 paper (3 hours)	100
2. Poetry and Drama	,, ,, ...	100
3. Prose	,, ,, ...	100

II. SECOND LANGUAGE

1. First Paper	1 paper (3 hours)	120
2. Second Paper	,, 2 ,, ...	80

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* It is recommended that no period be prescribed for special study in Literature, and that it is sufficient if candidates possess a general knowledge of the different periods.

III. Optional Subjects

			Max. Marks
A.	1. *Mathematics*—		
	First Paper	1 paper (2 hours)	100
	Second Paper	,, ,,	100
	2. *Physics*—		
	First Paper	1 paper (2 hours)	75
	Second Paper	,, ,,	75
	Practical Examination		50
	3. *Chemistry*—		
	First Paper	1 paper (2 hours)	75
	Second Paper	,, ,,	75
	Practical Examination		50
	4. *Geology*—		
	First Paper	1 paper (2 hours)	75
	Second Paper	,, ,,	75
	Practical Examination		50
	5. *Zoology*—		
	First Paper	1 paper (2 hours)	75
	Second Paper	,, ,,	75
	Practical Examination		50
	6. *Botany*—		
	First Paper	1 paper (2 hours)	75
	Second Paper	,, ,,	75
	Practical Examination		50
B.	1. *History*—		
	Ancient History	1 paper (3 hours)	180
	2. *Economics and Political Science*—		
	i. British Constitution	1 paper (3 hours)	180
	ii. Indian Economic Conditions	,, (2 ,,)	120
	3. *Philosophy* : *Group I*—		
	i. Logic	1 paper (3 ,,)	180
	ii. Plato and Aristotle	,, (2 ,,)	120

			Max. Marks
4. *Philosophy: Group II—*			
i. Ethics	1 paper	(3 hours)	150
ii. Psychology	,,	,, ...	150
5. *Sanskrit or Persian—*			
i Text-Books	1 paper	(3 ,,)	180
ii. Translation or Composition	,,	(2 ,,)	120
6. *Commerce—*			
i. Indian Economic Conditions	1 paper	(2 hours)	120
ii. Elements of Accountancy...	,,	(3 ,,)	100
iii. Elements of Statistics	,,	(3 ,,)	100
iv. Economic Geography	,,	(3 ,,)	100

Final Examination for the B.A. Degree

1. English: Drama	 1	paper	of 3	hours
,, Poetry	 1	,,		,,
,, Prose	 1	,,		,,
,, Composition	 1	,,		,,
2. **Second Language—*				
(i) Kannada: Texts, etc.	 1	,,		,,
,, Composition and Translation	 1	,,		,,
(ii) Telugu: Texts, etc.	 1	,,		,,
,, Composition and Translation	 1	,,		,,
(iii) Tamil: Texts, etc.	 1	,,		,,
,, Composition and Translation	 1	,,		,,

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* Candidates under the transitory rule will be examined at the Degree Examination of 1921 in *composition* in Kannada, Telugu, Tamil or Hindustani or *translation* into English from Sanskrit, Persian or French instead of the compulsory Second Language (*Vide* foot-note on page 41). This concession will not extend beyond 1921.

(iv)	Sanskrit :	Texts, etc.	 1	paper of	3 hours
	,,	Translation	 1	,,	,,
(v)	Hindustani :	Texts, etc.	 1	,,	,,
	,,	Composition and Translation	 1	,,	,,
(vi)	French :	Texts, etc.	 1	,,	,,
	,,	Composition and Translation	 1	,,	,,
(vii)	Persian :	Texts, etc.	 1	,,	,,
	,,	Translation	 1	,,	,,
3.	*Optional Subjects*—				
(i)	Mathematics :	Algebra and Trigonometry	1		,,
	,,	Geometry	 1		,,
	,,	Dynamics	 1	,,	,,
	,,	Calculus and Astronomy	.. 1	,,	,,
(ii)	Physics :	(Theory)	 3	papers of	3 hours each
	,,	(Practical)	 1	paper of	3 hours
(iii)	Chemistry :	(Theory)	 3	papers of	3 hours each
	,,	(Practical)	 1	paper of	3 hours
(iv)	Zoology :	(Theory)	 2	papers of	3 hours each
	,,	(Practical)	 2	,,	,,
(v)	Geology :	(Theory)	 2	,,	,,
	,,	(Practical)	 2	,,	,,
(vi)	Botany :	(Theory)	 2	,,	,,
	,,	(Practical)	 2	,,	,,
(vii)	History :	Indian History	 2	,,	,,
	,,	European History	2	,,	,,
(viii)	Economics		 2	,,	,,
	Political Science		 2	,,	,,
(ix)	Philosophy : Group I—				
	(*a*) Theory of Knowledge :		1	paper of	3 hours
	(*b*) History of Modern Philosophy		 1	,,	,,
	(Common to Group II also)				

REGISTRAR [illegible] UNIVERSITY

	(*c*) A Prescribed Classic...	1	paper	of 3 hours
	(*d*) Indian Philosophy	1	,,	,,
(x)	Philosophy: Group II—			
	(*e*) History of Ethics:	1	,,	,,
	(*f*) Political Philosophy:	1	,,	,,
	(*g*) Ethico-Political Classic	1	,,	,,
	A Second Philosophical Classic *(in the case of candidates who take up both the groups.)	1	,,	,,
(xi)	Sanskrit: Text Books—1st paper	1	,,	,,
	,, do Second paper	1	,,	,,
	,, History of Sanskrit Language and Literature	1	,,	,,
	,, Translation	1	,,	,,
(xii)	Persian: Text Books	1	,,	,,
	,, History of Persian Literature	1	,,	,,
	,, Grammar and History of Persian Language	1	,,	,,
	,, Translation and Composition	1	,,	,,

The following scheme has been prescribed for the Final Examination for the B.A. Degree in Sanskrit (Optional Subject) under the revised Ordinance (63 III B.) and courses of study on pages 130 and 131 of the Calendar.

Selected Subject ...	Prescribed books ...	Two papers of 3 hours' duration each.
,,	General ...	... One paper of 3 hours' duration.
Translation ...	...	... One paper of 3 hours' duration.

The scheme will come into operation in respect of the B. A. Degree Examination of 1922 and onwards.

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* From 1921-22, in lieu of a Second Philosophical Classic, Elements of Metaphysics will be substituted.

Time-table for the Final Examination for the B.A. Degree

Day	*Time*	*Subject*	*Max. Marks*
1st	10 a.m. to 1 p.m.	English : Drama* ...	100
	2 p.m. to 5 p.m.	English : Poetry* ...	100
2nd	10 a.m. to 1 p.m.	English : Prose*	100
	2 p.m. to 5 p.m.	English : Composition †	100
3rd	10 a.m. to 1 p.m.	Second Language— Texts and Grammar	100
	2 p.m. to 5 p.m.	Second Language— Composition, Translation	100
4th	....	*Holiday*	
5th	10 a.m. to 1 p.m.	Mathematics— (Algebra and Trigonometry). Indian History A Philosophy I A (Theory of Knowledge)	100
	2 p.m. to 5 p.m	Mathematics— (Geometry). Indian History B Philosophy I B (Outlines of Indian Philosophy)	100
6th	10 a.m. to 1 p.m.	Mathematics— (Dynamics) European History A Philosophy I C (Prescribed Classic)	100

*** The papers on drama, poetry and prose for the B. A. Degree Examination shall also contain general questions based upon the books recommended for study under Ordinance 68 (*b*) and (*c*)—I. English (*b*) and (*c*). *Vide* page 116.**

† There shall be 3 parts in the Composition paper and candidates shall be asked to write three essays, one on each of three non-detailed study books.

Day	*Time*	*Subject*	*Max. Marks*
	2 p.m. to 5 p.m.	Mathematics— (Calculus and Astronomy) European History B Philosophy I and II (Special paper)	100
7th	10 a.m. to 1 p.m.	Chemistry A Philosophy I and II D (History of Modern Philosophy)	100
	2 p.m. to 5 p.m.	Chemistry B Philosophy II A (History of Ethics)	100
8th	10 a.m. to 1 p.m.	Chemistry C Philosophy II B (Political Philosophy)	100
	2 p.m. to 5 p.m.	Chemistry *Practical* Philosophy II C (Ethico-Political Classic)	100
9th	10 a.m. to 1 p.m.	Physics A Economics A Sanskrit A Persian A	100
	2 p.m. to 5 p.m.	Physics B Economics B Sanskrit B Persian B	100
10th	10 a.m. to 1 p.m.	Physics C Political Science A Sanskrit C Persian C	100
	2 p.m. to 5 p.m.	Physics *Practical* Political Science B Sanskrit D Persian D	100
11th		***Holiday***	

Day	*Time*	*Subject*	*Max. Marks*
12th	10 a.m. to 1 p.m.	Zoology A	100
	2 p.m. to 5 p.m.	Zoology B	100
13th	10 a.m. to 1 p.m.	Zoology *Practical I*	100
	2 p.m. to 5 p.m.	Zoology *Practical II*	100
14th	10 a.m. to 1 p.m.	Geology A	100
	2 p.m. to 5 p.m.	Geology B	100
15th	10 a.m. to 1 p.m.	Geology *Practical I*	100
	2 p.m. to 5 p m	Geology *Practical II*	100
16th	10 a.m. to 1 p.m.	Botany A	100
	2 p.m. to 5 p.m.	Botany B	100
17th	10 a.m. to 1 p.m.	Botany *Practical I*	100
	2 p.m to 5 p.m.	Botany *Practical II*	100

Minima for Pass

FIRST YEAR CERTIFICATE

(*Vide* Ordinance 75)

FINAL EXAMINATION FOR THE B.A. DEGREE

(*Vide* Ordinance 76)

Publication of Results

FIRST YEAR CERTIFICATE

(*Vide* Ordinance 77)

FINAL EXAMINATION FOR THE B.A. DEGREE

(*Vide* Ordinance 78)

B.Sc. Degree Examination

* *Conditions of admission*

(*Vide* Ordinances 55, 64 and 65)

*** No one will be allowed to enter for the B.Sc. Degree Examination as a private candidate, unless such a candidate has once appeared already at this Examination.**

*Courses of study—(general).** Ordinance 64.

I. English.

II. A Second Language (Kannada, Telugu, Tamil, Sanskrit, Hindustani, French or Persian) provided that French (or German) shall be studied in the third year.

III. (*a*) In the first year—

(i) Mathematics, Physics, and Chemistry,

Or

(ii) Zoology, Geology, and Botany.

(*b*) In the second and third years, two subjects, one principal and the other subsidiary, selected from the group studied in the first year.

Provided that the Council may, on the recommendation of the Principal, allow any two subjects selected out of both the groups to be taken together in any case; provided further, that candidates taking Physics or Chemistry as a principal subject shall be required to attend courses in Mathematics and Chemistry or in Mathematics and Physics respectively.

In the case of Graduates (in Science) of this University who are admitted to the Second year B.Sc. class and who appear for the Degree Examination in two years, the Council shall have power to grant them exemption in English and Second Language.

*** The course will be the same both for the B. A., in Science and the B.Sc., for the first year. From the second year, the B.A. Science Course will be different from the B.Sc., Course. For the B.A., both the Science branches selected will be of the same standard, whereas for the B Sc., the main subject will be of a more advanced course, and the subsidiary subject will be the same course as for the B.A., Degree Examination, except for candidates who take Physics or Chemistry as their main subject.**

Courses of study—(detailed): Ordinance 68 (*d*)

A. ENGLISH

First year

Same as for B. A. first year.

Second and third years

Most of the time will be given to English Composition. The texts prescribed for study in detail will include a play of Shakespeare and a few modern prose texts. A few modern prose texts will also be prescribed for non-detailed study. Plot, incident and characterization will receive more attention than linguistic matters.

Two papers of three hours each will be set, one on the texts prescribed for study in detail, the other consisting of essays on the books prescribed for non-detailed study.

Third year

FRENCH

Drill in selected portions of any modern grammar. Practice in translation from an easy reading book. No text-books are prescribed.

B. SECOND LANGUAGE

First year

Same as for B.A. first year.

Second year

Text-books to be prescribed from time to time.

NOTE.—Any candidate who has passed the B.Sc. Examination may be admitted to the examination in a principal subject other than the one he has already offered for the examination, provided he has not taken the B.Sc. degree and has attended a regular course of lectures for two years on the said subject If he is successful in the examination, he will be certified to have taken the B.Sc degree in that subject also.

Third year

A modern European language.

C. OPTIONAL GROUP

(a) Mathematics

Second and third years

(MAIN SUBJECT)

Pure Mathematics

Pure Geometry, Algebra and Theory of Equations, Plane and Spherical Trigonometry, Differential and Integral Calculus, Elementary Differential Equations, Co-ordinate Geometry of two and three dimensions.

Applied Mathematics

Statics, Dynamics of a Particle, Dynamics of a Rigid Body (two Dimensions), Hydrostatics and Astronomy.

(b) Physics

Second and third years

(MAIN SUBJECT)

The general principles of Physics treated experimentally and mathematically to the extent of simple differential equations. A feature would be made of instruction in elementary workshop practice applied to the construction of apparatus, and in laboratory technique.

(c) Chemistry

Second and third years

(MAIN SUBJECT)

1. Historical and Theoretical Chemistry.
2. Inorganic Chemistry.
3. Physical Chemistry.

4. Chemistry of Carbon Compounds.

The practical course would include qualitative analysis of mixtures of inorganic substances and of minerals; volumetric and gravimetric analysis, including the determination of carbon, hydrogen, nitrogen, and chlorine in organic compounds; inorganic and organic preparations; and simple physico-chemical measurements.

(d) Natural Science

Where any of the three subjects, Zoology, Geology or Botany is taken as a major subject for the B.Sc. degree, the following additions should be made to the syllabus of the subjects as given for the B.A. degree for the second and third years:—

ZOOLOGY

Second and third years

(MAIN SUBJECT)

The scheme of subjects for the B.A. and B.Sc. subsidary will be treated more completely, and further amplified by the inclusion of minor groups like the Dicyemidæ, Orthonectidæ, Nemertea, Nematomorpha, Acanthocephala, Priapuloidea, and Phoronidea.

Outlines of animal histology, chiefly with reference to the frog and rabbit.

The main facts concerning vertebrate embryology with special reference to the development of the chick, with practical work.

Outlines of palæozoology, the history and philosophy of zoology.

The practical work will include dissection of any of the common types studied by the candidates, their identification with the aid of manuals, acquaintance with the use of the microtone, preparation of microscopical slides and ability to report on zoological collections.

GEOLOGY

Second and third years

(MAIN SUBJECT)

Mineralogy and Crystallography.—The thirty two types of crystal symmetry, theories of crystal structure, systems of crystal notation, zonal characters, crystal projections and drawing, twin crystals, grouping and irregularities of crystals, parting planes, percussion figures, etched figures, etc. Use of the Reflecting Goniometer. General mathematical relations of crystals and measurement of crystal angles.

Description and determination of minerals by chemical and physical tests.

The chief ores and minerals of commercial value; their distribution, occurrence, with special reference to Indian examples and their uses; nature and structure of chief types of ore deposits.

Petrology.—The principles underlying the genesis and classification of rocks. Mechanical separation of rock constituents; examination of sands, methods of the preparation of rock sections for the microscope. Optical properties of crystals. Practical determination of the optical characters of the chief rock-forming minerals with the petrological microscope, including the use of convergent light. Determination of the nature and history of rocks by means of the microscope.

Structural and Field Geology.—The relationships of structure to relief, drainage and economics. The composition and structure of rock masses as influencing scenery. Weathering and formation of soils.

Each candidate is required to map and describe from his own personal observation the geology of an area selected by himself with the approval of the Professors.

Stratigraphy and Palaeontology.—The geological formations with their lithology, sub-divisional fossils, correlation and economics. Physical geography and vulcanicity of the different periods. General distribution of existing faunas and floras and their relation to those of former geological periods, morphological characters of the more important types of fossils; drawing of fossils; geology of India brought up-to-date.

Laboratory work and Geological excursions.

BOTANY

Second and third years

(MAIN SUBJECT)

1. General principles of plant distribution especially as illustrated in South India.
2. A fuller knowledge of Phanerogamic orders especially those of South India.
3. Study of fungi and bacteria from an economic standpoint.
4. The principal botanical economic products of South India.
5. Outlines of Palaeobotany, evolution and heredity.

Scheme of Examination for the B.Sc. Degree:

Ordinance 91 (c).

I. English: Texts	....	1 paper of 3 hours.	
Do Composition	....	do	do
II. Subsidiary Subjects	...	(Same as for the B.A. Degree Examination).	
III. *Main Subjects*—			
(i) Physics: (Theory)	....	4 papers of	3 hours each.
Do (Practical)	....	2 ,,	4 ,,
(ii) Chemistry: (Theory)	....	4 ,,	3 ,,
Do (Practical)	....	2 ,,	6 ,,

(iii)	Mathematics	6 papers of	3	hours each.
(iv)	Geology : (Theory)	4 ,,	3	,,
	Do (Practical)	3 ,,	3	,,
(v)	Zoology : (Theory)	4 ,,	3	,,
	Do (Practical)	3 ,,	3	,,
(vi)	Botany : (Theory)	4 ,,	3	,,
	Do (Practical)	3 ,,	3	,,

Time-table for the B.Sc. Degree Examination

Day	*Time*	*Subject*	*Max. Marks*
1st	10 a.m. to 1 p.m.	English : Texts	100
	2 p.m. to 5 p.m.	English : Composition	100

Main Subjects

18th	10 a.m. to 1 p.m.	Physics A	100
		Chemistry A	75
		Mathematics A	100
		Geology A	75
		Zoology A	75
		Botany A	75
	2 p.m. to 5 p.m.	Physics B	100
		Chemistry B	75
		Mathematics B	100
		Geology B	75
		Zoology B	75
		Botany B	75
19th	10 a.m. to 1 p.m	Physics C	100
		Chemistry C	75
		Mathematics C	100
		Geology C	75
		Zoology C	75
		Botany C	75

Day	*Time*	*Subject*	*Max. Marks*
19th	2 p.m. to 5 p.m.	Physics D	 100
		Chemistry D	 75
		Mathematics D	 100
		Geology D	... 75
		Zoology D	... 75
		Botany D	... 75
20th	10 a.m. to 2 p.m.	Physics *Practical I*	100
	10 a.m. to 4 p.m.	Chemistry *Practical I*	....
	10 a.m. to 1 p.m.	Mathematics E	100
	2 p.m. to 5 p.m.	do F	100
	10 a.m. to 1 p.m.	Geology *Practical I*	100
	2 p.m. to 5 p.m.	do *Practical II*	100
	10 a.m. to 1 p.m.	Zoology *Practical I*	100
	2 p.m. to 5 p.m.	do *Practical II*	100
	10 a.m. to 1 p.m.	Botany *Practical I*	100
	2 p.m. to 5 p.m.	do *Practical II*	100
21st	10 a.m. to 2 p.m.	Physics *Practical II*	100
	10 a.m. to 4 p.m.	Chemistry *Practical II*	....
	10 a.m. to 1 p.m.	Geology *Practical III*	100
	10 a.m. to 1 p.m.	Zoology *Practical III*	100
	10 a.m. to 1 p.m.	Botany *Practical III*	100

N.B.—(1) Maximum for laboratory records and class progress for all main subjects. . . . . . 150.

(2) In the case of B.Sc. students taking the B.A. Papers in Subsidiary subjects, 100 marks is the maximum allotted for laboratory records

Note.—The practical papers in Chemistry will carry each twice as many marks as the written papers.

Minima for pass and Publication of results
(*Vide* Ordinance 79)

B. Com. Degree Examination

** Conditions of admission*
(*Vide* Ordinance 55)

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* No one will be allowed to enter for the B Com. Degree Examination as a private candidate, unless such a candidate has once appeared already at this Examination.

Courses of study—(general): Ordinance 66.

(i) In the first year,

I. English (same as for B.A. first year).

II. Second Language (same as for B.A. first year, the classical Languages, Sanskrit and Persian. being excluded).

III. (*a*) General Economics.
 (*b*) Accountancy.
 (*c*) Geography (Physical and Commercial).
 (*d*) Elements of Statistics.

(ii) In the second and third years,

I. English (prescribed text-books, Commercial Correspondence, etc.)

II. (*a*) General Economics.
 (*b*) Economic History.
 (*c*) Mercantile and Industrial Law.
 (*d*) Business Organisation.

III. One of the following special subjects:—
 (*a*) Administration.
 (*b*) Advanced Accounting and Auditing.
 (*c*) Actuarial Science.
 (*d*) Advanced Banking.
 (*e*) Advanced Economic Theory and History.
 (*f*) Economics of Transport.

Courses of study—(detailed): Ordinance 68 (*e*).

First year

(*a*) ENGLISH

Same as for B.A. first year.

(*b*) SECOND LANGUAGE

Same as for B.A. first year, the classical languages, Sanskrit and Persian being excluded.

(*c*) GENERAL ECONOMICS

Same as for B.A.

(*d*) ACCOUNTANCY

Elements of Book-keeping by Double Entry; a description of all the usual subsidiary books dealing separately with non-trading, trading and manufacturing concerns; the posting of the Ledger or Ledgers: the extraction of the Trial Balance; and the preparation therefrom of the periodical Balance Sheet, and of Trading and Profit and Loss accounts. The distinction between Capital and Revenue, between Fixed and Floating Assets; Theory of Compound Interest, Life and Sinking Fund tables; Rapid Arithmetical methods.

(*e*) GEOGRAPHY

Physical Geography as to basis of the various types of civilization and a determining factor of national and economical development. Configuration of the great land masses and oceans. Wind and water currents; climate, distribution of flora and fauna and of mankind.

Detailed study of the physical characteristics of India.

Main features of other continents.

Trade routes.

Commercial Geography.—Present day production of the chief countries in agriculture, mining, industry and commerce.

(*f*) ELEMENTS OF STATISTICS

Second and third years

(*a*) ENGLISH

(1) Prescribed text-books.

(2) Commercial correspondence, drafting reports, circulars, etc., and precis writing.

(*b*) GENERAL ECONOMICS

(*c*) ECONOMIC HISTORY

(1) English economic history as typical of the line of industrial and social evolution in Europe (the

manor, guild, mercantilism, the domestic system, the industrial revolution, capitalistic production, control of labour conditions, commercial policy.)

(2) The economic history of India from the beginning of the British rule.

(3) Main facts of the economic growth and the share of the State in encouraging that growth during the last 100 years in Germany and Japan.

(*d*) MERCANTILE AND INDUSTRIAL LAW

(1) The Indian Law relating to contracts, mortgages, joint stock companies, negotiable instruments, charter parties, bills of lading, fire and marine insurance and insolvency.

(2) The provisions of the Stamp and the Limitation Acts relating to the above.

(*e*) BUSINESS ORGANIZATION

(1) Nature of constitution of business houses, partnerships, public and private companies; financing new business; organization of control and responsibility; organization of credit; inquiring agencies; bank and business references; value and methods of statistical investigation.

(2) The organization of markets and the interdependence of market phenomena and industrial phenomena. Produce markets and markets for manufactures. Industrial combinations and regulation of output. Factory legislation. The concentration of specialized industries, production on a large scale, localised industries.

(3) The rise and progress of the cotton industry in England, India, the United States, and Japan; present conditions and prospects.

(*f*) One of the following special subjects:—

A. Administration

(i) Indian Administration—

(1) The Secretary of State and his Council.

(2) The Governor-General and his Council.

(3) The Provincial Governments.

(4) Municipal and District Administration.

(5) Administrative machinery, with respect to finance, public works, police, justice, medical and sanitary services, education, transport, irrigation, land tenures, land revenue, commerce and agricultural departments, etc.

(ii) Main points in the Government of the United Kingdom, as far as they are of general imperial interest. Fundamental features of the constitution—Crown, Parliament, Cabinet, Executive Departments, Civil Service, Method of Legislation.

(iii) Relation between the component parts of the Empire.

B. Advanced Accounting and Auditing

(1) The accounts of the different kinds of business including banks, insurance companies, factories, mining companies, railways and hotels, charitable institutions, and other non-trading concerns. Partnership accounts, including treatment of good-will. Income and expenditure accounts, branch accounts, cost accounts, bankruptcy accounts. departmental accounts, depreciation. reserves, sinking funds; the double account system; columnar book-keeping.

(2) *Auditing.*—The continuous and the completed audit; the detection of fraud, technical errors and errors of principle; first and subsequent audit; verifying cash, securities, stock sheets, wages sheets; special considerations in the different classes of audit; valuation of fixed and floating assets; forms of accounts and balance sheets. Capital and revenue items, the auditor's certificate; the liabilities of auditors; the conduct of investigations and the certifying of average profits.

C. Actuarial Science

(1) The binomial and exponential theorems; the theory and use of logarithms; the elements of the theory of probabilities; the elements of the calculus of finite differences, including interpolation and summation; Elementary Differential and Integral Calculus, excluding questions requiring the use of Trigonometry.

(2) Compound interest and annuities-certain, including the construction and use of relative tables. Valuation of perpetuities, varying annuities and increasing annuities. Capital redemption assurances.

(3) Life contingencies, including life annuities and assurances, and the construction and use of the life table, and monetary and other tables based thereon; excluding questions on the compilation of tables from statistics, or on graduation.

(4) The classification of policies for valuation, and the preparation of valuation class books.

D. Advanced Banking

(*a*) Principles—

(1) *Metallic Currency.*—The functions and economic significance of money. Various forms of money. Metallic currencies and coinage The English Mint Regulations and Coinage Acts. Currency deterioration, its causes, measures and remedies. Legal tender; the various systems prevailing in different countries. Methods of maintaining internal equivalence of legal tender moneys. Question of monetary standard and valuation. Decimal coinage. Various proposals for international money. Method of measuring variations in the value of money. Indian currency problems

(2) *Banking and the Money Market.*—The functions and economic significance of banking. The general structure and methods of English Banking. The cheque system and the clearing house. Banking investments. The short loan fund. The money market;

its fluctuations, periodic and other. The reserve and the discount rate. The regulation of note-issue. and the Bank Acts. £1 notes. Comparison with foreign systems. Recent developments in English banking. Indian banking. General banking statistics. The foreign exchanges. Financial and commercial crisis.

(*b*) Banking Law.

E. Advanced Economic Theory and History

(1) Important modern problems of theory and history.
(2) History of economic thought.
(3) Indian economics.

F Economics of Transport

Scheme of Examination for the B. Com. Degree :
Ordinance 91 (*d*).

Each paper will be for three hours and carry 100 marks.

I.	(1)	English Essay	1 paper.
	(2)	Economic History	1 paper.
	(3)	Economics	2 papers.
II.	(1)	Commercial Correspondence	1 paper.
	(2)	Business Organisation	1 paper·
	(3)	Mercantile and Industrial Law....	2 papers.
III.		Special Subject	3 papers.

Time-table for the B. Com Degree Examination

Day	*Time*	*Subject*	*Max. Marks*
1st	10 a.m. to 1 p.m.	English : Essay	100
	2 p.m. to 5 p.m.	Commercial Correspondence	100
2nd	10 a.m. to 1 p.m.	Business Organisation	100
	2 p.m. to 5 p.m.	Economic History	100
3rd	10 a.m. to 1 p.m.	Mercantile and Industrial Law I	100
	2 p.m. to 5 p.m.	Mercantile and Industrial Law II	100

Day	*Time*	*Subject*	*Max. Marks*
4th *5th*		*Holiday*	
6th	10 a.m. to 1 p.m.	Special Subject I	100
	2 p.m. to 5 p.m.	do II	100
7th	10 a.m. to 1 p.m.	do III	100
8th		*Holiday*	
9th	10 a.m. to 1 p.m.	Economics A	100
	2 p.m. to 5 p.m.	do B	100

Minima for pass

(*Vide* Ordinance 81)

Publication of Results

(*Vide* Ordinances 82 and 83)

B. E. Degree Examination

A. INTERMEDIATE EXAMINATION IN ENGINEERING

* *Conditions of admission*

(*Vide* Ordinances 55 and 84)

Courses of study—(general) : Ordinance 67

A. LECTURES

1. Pure Mathematics ....
   - i. Mensuration.
   - ii. Algebra.
   - iii. Geometry.
   - iv. Co-ordinate Geometry of two dimensions.
   - v. Trigonometry.

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* No one will be allowed to enter for the Intermediate Examination in Engineering as a private candidate, unless such a candidate has once appeared already at this Examination.

2. Applied Mathematics (Course 1) ... i. Statics.
    ii. Dynamics.
3. Science .... i. Physics.
    ii. Chemistry.
4. Geology and Mineralogy.
5. Elements of Political Economy.
6. Materials of Construction.
7. Building Construction (Course I).

B. PRACTICAL WORK

1. Drawing .... i. Free-hand Drawing including Model Drawing and Sketching.
    ii. Geometrical Drawing.
    iii. Building Drawing and Estimating.
    iv. Mechanical Drawing.
2. Surveying .... i. Chain, Compass, Plane table and Levelling.
3. Workshop .... i. Lectures.
    ii. Practice.
4. Practice in Physical and Chemical Laboratory.

Courses of study—(detailed): Ordinance 68 (*f*)

A. Lectures

1. PURE MATHEMATICS

1. *Mensuration.*—Plane and solid. Use of the Planimeter.

2. *Algebra.*—Permutations and combinations. Binomial Theorem (any index). Elementary tests of convergence and divergence of series. Exponential and Logarithmic series. Elementary summation of series. Simple properties of equations. Solution of equations by graphs. Approximate solutions of equations by Horner's method.

3. *Trigonometry.*—Use of tables. Logarithmic solution of triangles. Heights and distances. Circular functions and the use of their expansions.

4. *Co-ordinate Geometry.*—The straight line, circle, parabola, ellipse and hyperbola (referred to rectangular axes) and simple problems thereon. Curve tracing.

5. *Solid Geometry.*—Elements.

2. APPLIED MATHEMATICS

(Course I)

1. *Kinematics.*—Displacement in one plane. The Instantaneous centre. Composition and resolution of displacements, velocities and accelerations.

2. *Kinetics.*—Newton's laws of motion. Conservation of momentum and energy. Motion under gravity including projectiles. Simple Harmonic motion. Simple Pendulum. Impact. Moment of Inertia.

3. *Statics.*—Composition and resolution of forces. Equilibrium of forces acting in one plane. Graphical statics. Moments. Couples. Centre of gravity. Work. Friction. Simple machines.

3. SCIENCE

1. *Physics.*—Heat. Temperature. The construction and use of instruments for measuring temperature. The expansion of solids, liquids and gases with change of temperature. Heat as quantity, and the methods of calorimetry. Change of state. Latent heat; the laws of evaporation; boiling. The conduction of heat. Phenomena attending convection in fluids. Radiation and the laws of cooling. The nature of heat. Determination of dynamical equivalent of heat. The laws of thermodynamics with simple applications. Natural sources of heat, fuels.

Light.—Theory and construction of optical instruments explained in a simple manner.

Electricity and Magnetism

1. Magnets. Magnetic bodies. The magnetic field, lines of force. Forces and couples on magnets in the magnetic field. The earth's magnetic field. The phenomena of magnetic induction; the magnetic properties of iron and steel. Hysteresis.

2. Electrification; conductors and insulators; the electrostatic field; the electrostatic induction. Charge; potential and capacity of condensers; discharge; current; energy of charged condensers.

3. The more common cells for producing currents. The magnetic field of current galvanometers. The source of energy for maintaining it. Electromotive force. Ohm's law. Resistance and its measurement. Wheatstone's Bridge.

The heating effects of currents; fuses; incandescent lamps. Elementary phenomena of electrolysis.

The Clark Cell and the potentiometer system of measuring E.M.F. current, etc.

4. Potential energy of circuit-carrying current placed in magnetic field and derivation of forces and couples on circuit. Application to moving coil instruments (ammeters, voltmeters, etc.).

5. Electro-magnetic induction. Maxwell's law. The variable and steady period of current in a circuit. Simple machines for producing continuous and alternating currents. Induction coil.

Chemistry (Theory)

1. Physical and chemical change. Constitution of matter. Simple and compound substances. Chemical action. Chemical nomenclature and symbols The atomic theory. Equivalent atomic and molecular weights. Specific and atomic heats. Calculation of weight and volumes of substances involved in chemical reactions. General properties of gases. Liquifaction.

Diffusion. Solution. Dissociation. Electrolysis. Kinetic theory of gases and its application.

2. The Chemistry of the following non-metallic elements and their more important compounds—hydrogen, oxygen, nitrogen, chlorine, bromine, iodine, fluorine, sulphur, phosphorus, arsenic, boron, carbon and silicon.

3. Chemical and physical characteristics of metals as illustrated by sodium, calcium, iron, zinc, lead, mercury, copper, silver and gold.

4. GEOLOGY AND MINERALOGY

1. *Mineralogy.*—The chief characteristics of the most important rock-forming minerals, their composition, crystal or other form, habit, cleavage, specific gravity, hardness, lustre, colour and streak. Occurrence and alteration products.

2. *Petrology.*—Origin, classification and composition of the leading types of rocks, with special reference to those used by the Engineer and Architects, their durability.

Mode of occurrence and distribution in Mysore of the building and ornamental stones and other (mineral) building materials.

3. *Physical Geology.*—The general nature and relation of the main agents of geological changes and their action; the leading structures of rock-masses, bedding, dip, strike, folds, faults, cleavage, foliation and jointing and their significance in questions of quarrying, foundations and superstructure. Relation between geological structure and scenery.

4. *Stratigraphical Geology.*—Stratigraphical classification; the meaning of unconformity and overlap; imperfection of the Geological Record; fossils, their value in determining geological chronology; the general characteristics of the great systems of strata with special referance to India; Geological History of Mysore.

5. *Practical Examinations.*—Preparation and interpretation of physical and geological maps and the drawing of sections across them. Identification and description of hand specimens of minerals and rocks.

6. *Geological Excursions.*

5. POLITICAL ECONOMY

The ideas of political economy and the methods by which they are studied; relation of economic science to practice; the meaning of economic law; demand and consumption; the law of diminishing utilty. The factors in production and their combinations; labour and natural agents; increasing and decreasing returns: capital, its influence and the conditions of its accumulation. Value in relation to riches, price, utility and cost of production; determinants of ratios of exchange; the elements of cost; complex problems of value; the theory of international trade and its relation to the home trade. The law of rent; interest and profits; causes of the rates of wages General theory of the value of money; the value of foreign bills; principles of taxation.

6. BUILDING MATERIALS

1. *Stone.*—Characteristics and varieties of building stone, varieties met with in Southern India and Mysore. Artificial stones. Quarrying, blasting. Preparation and use.

2. *Bricks and Tiles.*—Brick and tile earths. Preparation by ordinary methods and by use of machinery. Burning in kilns, clamps and Hoffman's kiln. Characteristics of good bricks and tiles.

3. Limes, Cements, Mortar, Plaster, Concrete (plain and reinforced.) Sources, properties, preparation and use. Ordinary and hydraulic mortars, Portland cement and its manufacture. Practical tests of limes and cements.

4. *Timber.*—Growth and felling. Seasoning, natural and artificial. Conversion, Preservation of timber. Characteristics of good timber. Important varieties in use in Southern India and Mysore.

5. *Metals.*—Cast iron, wrought iron and steel. Elementary description of processes of their manufacture, varieties, uses, and preservation. Use of other common metals as copper, zinc, lead and alloys.

6. Colour wash paints, and varnishes and miscellaneous materials as papering, patty, glazing, etc., preparation and use.

7. ELEMENTARY BUILDING CONSTRUCTION

Course 1

Stone masonry. Brick masonry. Foundations. Carpentry:—joints, connections, roof frames, doors, windows and stair cases, etc. Roofs and floors. Arches.

B. Practical Work

1. DRAWING

(*a*) Free-hand and Model drawing including lettering and details of machines.

(*b*) Geometrical Drawing— (1) Practical Plane Geometry:—Problems on lines, triangles, quadrilaterals, circles, and polygons. Parabola, ellipse, hyperbola, cycloid and spiral and other curves. (2) Practical Solid Geometry:—Projections of points, lines and planes. Projection of simple solids. Isometric projection and elements of perspective.

(*c*) Drawing from copy and sketch and details of machines.

(*d*) Drawing and estimating of small buildings and their parts.

2. SURVEYING

Use and adjustment of instruments. Methods of surveying with the chain, prismatic compass and plane table. Elementary Levelling.

3. WORKSHOP PRACTICE

A. Lectures—

Lectures on the constiuction and use of tools in Fitter's, Smith's, Foundry and Carpenter's shops.

B. Practice—

Fitter's shop—Exercises in chipping and filing to straight edge and surface plate. Scraping. Screwing and tapping; use of scribing block, surface gauge and squares in marking out work.

Smith's shop—The forge and its tools. Management of fire. Drawing taper, square, and parallel work. Bending, upsetting, twisting, punching, and cutting. Welding and scarfing. Forging, hardening and tempering tools and springs. Practice in soldering and brazing.

Foundry shop—Moulders' tools, appliances and materials. The cupola. The brass furnace. Core making. Bench moulding. Blacking, coring and finishing moulds. Vents, gates and risers. Special methods required in brass moulding. Floor moulding. Open sand work.

Carpenter's shop—Sawing, Chipping, Planing, Joints.

Scheme for the Intermediate Examination in Engineering: Ordinance 91 (*e. 1*).

No.	Name of Subject	No. of Papers	Hours	Written Paper (Theory)	Practical and oral	Practical Work done during the Course	Total	Minima for passing
	Group I. Mathematics Pure and Applied—							
1	Mensuration, Trigonometry and Algebra.	1	3	100	...	...	...	...
2	Analytical and Solid Geometry.	1	3	100	...	25	...	...
3	Statics and Dynamics...	1	3	100	...	...	...	...
	Total ...	...	...	300	...	25	325	25%

No.	Name of Subject	No. of Papers	Hours	Written Paper (Theory)	Practical and oral	Practical work done during the course	Total	Minima for passing
	Group II. Science—							
4	Physics, Theory ...	1	2	50	...	...	...	...
5	Physics, Practical ...	...	...	...	30	25	...	...
6	Chemistry, Theory ...	1	2	50	...	...	...	...
7	Chemistry, Practical...	...	...	...	30	25	...	...
8	Geology, Theory ...	1	2	60	...	...	...	...
9	Geology, Practical ...	...	...	...	25	...	...	...
10	Political Economy ...	1	2	40	...	...	...	...
	Total ...	...	...	200	85	50	335	25%
	Group III. Engineering							
11	Building Materials and Construction	1	3	150	...	50	...	...
12	Estimating ...	1	3	50	...	15	...	...
13	Workshop Theory ...	...	...	...	60	65	...	...
	Total ...	...	...	200	60	130	390	33⅓%
	Group IV. Surveying—							
14	Surveying, Theory ...	1	3	70	...	...	...	...
	Surveying, Practical...	...	...	...	70	75	...	...
	Total ...	...	...	70	70	75	215	33⅓%
	Drawing Group I—							
15	Freehand and Geometrical Drawing.	1	3	60	...	60	...	...
16	Mechanical Drawing...	1	3	40	...	40	...	...
17	Building Drawing ...	1	4	75	...	60	...	...
	Total ...	...	...	175	...	160	335	33⅓%
	Grand Total ...	13	...	945	215	440	1600	40% for a pass, 60% for 1st class.

Time-Table for the Intermediate Examination in Engineering

Day	*Time*	*Subject*	*Max. Marks*
1st	10 a.m. to 1 p.m.	Mensuration. Trigonometry and Algebra ...	100
	2 p.m. to 5 p.m.	Analytical and Solid Geometry ...	100
2nd	10 a m. to 1 p.m.	Statics and Dynamics ...	100
	2 p.m. to 4 p.m.	Physics, Theory	50
3rd	10 a.m. to 12 noon	Chemistry, Theory....	50
	12-15 p.m. to 2-15 p.m.	Geology, Theory	60
	3-15 p.m. to 5-15 p.m.	Political Economy	40
4th	*Holiday*		
5th	10 a.m. to 1 p.m.	Building Materials and Construction	150
	2 p.m to 5 p.m.	Estimating	50
6th	10 a.m. to 1 p.m.	Surveying. Theory	70
7th	10 a.m. to 1 p.m.	Free-hand and Geometrical Drawing	60
	2 p.m. to 5 p.m.	Mechanical Drawing	40
8th	10 a.m. to 2 p.m.	Building Drawing	75

N.B—The date and the hour of Practical Examination in various subjects will be announced to the candidates after the written examination is over. For records of class work and other details *vide* Scheme of Examination.

B. FINAL EXAMINATION IN ENGINEERING

* *Conditions of admission*

(*Vide* Ordinance 87)

Courses of study—(*general*): Ordinance 67.

I. CIVIL ENGINEERING

A. Lectures—

1. Pure Mathematics.
2. Applied Mathematics.

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*No one will be allowed to enter for the B. E Degree Examination as a private candidate, unless such a candidate has once appeared already at this Examination.

3. Applied Machanics.
4. Hydraulics.
5. Building and other forms of Construction.
6. Irrigation and Water Supply, Sanitary and Municipal Engineering.
7. Roads, Bridges and Railways.
8. Steam and Internal Combustion Engines.
9. Elementary Electrical Engineering.
10. Engineering Economics.

B. Practical Work—

11. Surveying.
12. Drawing and Estimating.
13. Practice in Workshop and Laboratory.

II. Mechanical Engineering

A. Lectures—

1. Integral and Differential Calculus.
2. Statics and Dynamics. and Hydrostatics.
3. Applied Mechanics.
4. Hydraulics and Hydraulic Machinery.
5. Theory of Machines.
6. Machine Design and Construction.
7. Heat Engines.
8. Power Plant Engineering.
9. Elementary Electrical Engineering.
10. Machine Drawing.
11. Estimating and Specifications.
12. Engineering Economics.

B. Practical Work—

13. Machine Shop.
14. Laboratory.

III. Electrical Engineering

A. Lectures—

1. Pure Mathematics.
2. Applied Mathematics.
3. Hydraulics.

4. Thermodynamics.
5. Mechanism.
6. Power Plants.
7. Electrical Engineering.
8. Alternating Current Theory.
9. Electrical Design.
10. Economics.

B. Practical Work—

1. Drawing and Estimating.
2. Workshop Practice.
3. Laboratory.

Courses of study—(detailed): Ordinance 68 (*f*).

I. CIVIL ENGINEERING

A. Lectures.

1. PURE MATHEMATICS

1. *Differential Calculus.*—Fundamental notions with special applications to geometrical and mechanical problems. Expansions in series. Maxima and minima of functions of one variable and simple examples in two variables. Tracing of well-known curves from their cartesian and polar equations. Curvature, envelope, evolutes, involutes. Change of variable. Partial Differentiation.

2. *Integral Calculus.*—Integration of standard forms and simple formulæ of reduction. Definite Integrals. Lengths and areas of plane curves. Volumes and surfaces of solids of revolution. Integration as the limit of a sum. Double and triple integrals as applied to centres of mass, pressure, and moments of inertia. Planimeters. Elementary standard forms of differential equations.

2. APPLIED MATHEMATICS

A more detailed study of course I (*vide* syllabus for Intermediate Examination in Engineering) with special reference to the applications of the Calculus including the following:—

Kinetics.—Motion of a particle on a curve. D'Alembert's principle. Angular momentum and kinetic energy of a rigid body in motion.

Statics.—Force and funicular polygons. Virtual work. Stable and unstable equilibrium. Equilibrium of forces in three dimensions. Bending moments. The common catenary.

Hydrostatics.—Transmission of fluid pressure. Thrusts due to fluid pressure on a plane area. Centre of pressure. Fluid thrusts on bodies wholly or partially immersed. Equilibrium of floating bodies. Metacentre. Hydrostatic Machines. Principles underlying the action of suction pump, force pump, centrifugal pump, syphon and hydraulic press.

3. APPLIED MECHANICS

(Treated graphically as well as analytically)

1. *Stress and Strain and Testing of Materials.*
   - (*a*) Modulus of elasticity and resilience, elastic limit, and fatigue of metals. Factor of safety and working stress. Simple and compound states of stress. Ellipse of stress.
   - (*b*) Testing of materials of construction and the Mechanical properties of materials.

2. *Theory and Design of structures in wood, iron and masonry.*
   - (*a*) Frames of different kinds for roofs, bridges and other structures under different conditions of loading including wind pressure. Stress diagrams and method of sections.
   - (*b*) Beams-bending moment, and shearing force for fixed and moving loads. Continuous beams. Deflection and stiffness.
   - (*c*) Combined bending and thrust. Struts and columns. Gordon's, Rankine's and Euler's formulæ.

(*d*) Torsion. Strength of shafting and other practical applications.
(*e*) Shells and thick cylinders.
(*f*) Arches of metal and masonry, masonry dams and weirs, retaining walls, chimneys, towers and foundations.
(*g*) Rivetted joints and bolts and other connections.

4. HYDRAULICS

Motion of water. Stream line and turbulent motion. Bernoulli's theorem and its simple applications.

Orifices and notches.—Discharge from orifices, notches and mouth pieces. Weirs and anicuts. Bridge openings. Co-efficients and their variations in different cases.

Flow in pipes.—Discharge through pipes. Losses of head in pipe at bends, valves, etc. Syphons and nozzles.

Flow in channels.—Calculation of discharges and design of sections.

Rivers.—Estimation of discharges. Gauging. Current meter, etc.

Meters.—Venturi meter and other meters.

Hydraulic appliances—General description and methods of working of hydraulic appliances such as turbines, water wheels, pumps and water lifts.

5. BUILDING AND OTHER FORMS OF CONSTRUCTION

Foundations. Masonry and brick work. Building construction. Principal orders in Architecture. Reinforced concrete.

6. IRRIGATION AND WATER SUPPLY, SANITARY AND MUNICIPAL ENGINEERING

(*a*) *Irrigation*—
(1) Rain fall and run off.
(2) Design, construction and maintenance of tank and reservoir works. High masonry Dams.

(3) Design, construction and maintenance of anicuts, canals and channels and subsidiary masonry works such as head sluices, aqueducts, superpassages, weirs, sluices, etc.

(4) Distribution and regulation of water.

(*b*) *Water Supply.*—Design of works by storage and pumping. Filtration and distribution. Jewel Filters.

(*c*) *Sanitary and Municipal Engineering.*—General principles of designing works of drainage and sewage of towns. Flushing arrangements including pumping stations, laying of sewers and methods of purification. General principles underlying Town planning. Town refuse collection and disposal.

7. Roads, Bridges and Railways

(*a*) *Roads.*—Earth work. Location, design, construction and maintenance of roads. Earth, gravel and metalled roads. Retaining walls.

(*b*) *Bridges.*—Location, design and construction. Waterway. Foundations.

(*c*) *Railways.*—General principles of location, design and construction of Railways. Setting out tunnels and their construction. General description of harbour works and their construction.

8. Steam and Internal Combustion Engines

Boilers.—Various types of boilers—Vertical, land and marine, such as Lancashire, Cornish, water tube, smoke tube, Locomotive and Yarrow boilers. Types of furnaces and methods of firing boilers by hand.

Steam Engines.—Properties of steam. Entropy diagram. Calender's equation. Carnot's perfect engine; Rankine's cycle. Engines. Simple, compound and multiple expansion engines. Pumps and air compressors.

Various types of condensers.—Atmospheric, jet, surface condensors, Internal combustion engines. Gas and oil engines, description of important types.

Fuels.—Calculations on combustion of fuel—such as calorific value of fuel. Given its composition, to find the theoretical quantity of air required and the composition of flue gases. Given the composition of flue gases, to find the excess of air.

Types of fuel.—Solid, liquid and gaseous—and their advantages and disadvantages.

Solid fuel.—Wood, charcoal and coal.

Manufacture of charcoal.

Formation, nature and source of coal. Classification of coal. Carbonization of coal and manufacture of coke.

Liquid fuel.—Formation, nature and source of petroleum, distillation of petroleum and manufacture of petrol, kerosine oil, etc. Manufacture of Alcohol and shale oil, benzine, Tar oils.

Atomisers suitable for burning oils under boilers.

Gaseous fuel.—Natural and blast furnace gases. Manufacture and nature of coal gas, producer gas, water gas, semi-water gas, suction gas, etc. Bye-product recovery plants.

Surface combustion and combustion of gas under boilers. Testing of various types of fuel for their calorific value.

9. ELEMENTARY ELECTRICAL ENGINEERING

(The subject will be dealt with only on general lines).

(*a*) Elementary Magnetism and Electricity as usually covered by first courses in Physics. Magnets and magnetic materials—magnetic field.—The laws of magnetic attraction and repulsion.

Static Electricity—Eletrostatic field. Frictional electricity machines—conductors and non-conductors of electricity.

(*b*) *Magnetic and Electrical Units.*—Lines of force, units of Magnetism and Electrical charge, Magnetic and Electric potentials, capacity. Electric current, Resistance and potential.

(*c*) *The Magnetic and Electric Circuits.*—Relation between electric current and magnetic flux. Magnetic properties of iron. Saturation curves. Solenoids and lifting magnets.

Laws of Electro-magnetic induction.

Ohm's law.

Direct and Alternating current circuits. Resistance, Reactance, Impedance, self and mutual induction. Hysteresis and Eddy currents.

(*d*) The magnetic and electric circuits of the following electrical machinery, and their characteristics:—

Transformers
Alternators
Continuous current Generators
A.C. & D.C. motors and
Rotary converters.

(*e*) Generation, transmission and distribution of electric power. Steam, gas and hydro-electric power stations, transmission lines, receiving stations and distribution circuits.

(*f*) Industrial applications of electric power in various forms such as motor drives for mills, tramway, pumping, etc., electric heating in furnaces and the care and maintenance of the various electrical apparatus.

10. ENGINEERING ECONOMICS

Efficiency management or human engineering (including social welfare work for labour) according to recent theories. Organisation and control of labour. Trades unions, their development, utility and drawbacks; workman's insurance and old age pensions, factory legislation. System of accounts. Specification and contract. Capital and Revenue. Productive and protective works and their financing. Maintenance and operation. Losses due to depreciation, interest, etc. Drawing up of departmental reports.

B. Practical Work

11. SURVEYING

(*a*) *Surveying and Mapping.*—Theodolite. Different forms of theodolite such as the Everest and the Transit. Uses and adjustments. Triangulation and traversing with the theodolite and finding heights and distances. Setting out curves. Use of the sextant and planimeter.

(*b*) Hill and tank contours. Laying out hill roads. Engineering Surveys for tanks, canals and roads and railways and drainage. Enlarging maps.

(*c*) General operations of setting out and measuring engineering works.

12. DRAWING AND ESTIMATING

(*a*) *Drawing.*—Drawing from sketches and specifications for Buildings, Bridges and Irrigation works.

(*b*) *Estimating and specifications.*—Ordinary cases of Buildings, Bridges and Irrigation works.

13. WORKSHOP PRACTICE AND LABORATORY

(*a*) Workshop practice in lathe and other simple machines.

(*b*) *Testing machine and its construction.*—Testing the strength of materials. Cement and mortar testing.

(c) Photography.

II. MECHANICAL ENGINEERING

A. Lectures

1. INTEGRAL AND DIFFERENTIAL CALCULUS

As for Civil Engineering.

2. STATICS AND DYNAMICS

As for Civil Engineering.

3. APPLIED MECHANICS and GRAPHIC STATICS

As for Civil Engineering.

4. HYDRAULICS AND HYDRAULIC MACHINERY

(*a*) *Hydraulics.*—Motion of water—stream line and turbulent motion. Bernoulli's theorem and its simple applications.

Orifices and notches.—Discharge from orifices, notches and mouth pieces. Weirs and anicuts. Bridge openings. Co-efficients and their variations in different cases.

Flow in pipes.—Discharge through pipes. Losses of head in pipes at bends, valves, etc. Syphons and nozzles.

Flow in channels.—Calculation of discharges and design of sections.

Rivers.—Estimation of discharges. Gauging. Current Meter.

Meters.—Venturi meter and other meters.

(*b*) *Hydraulic Machinery.*—Theory, design and efficiency of pumps. Lift pump and force pumps. Worthington pumps. Centrifugal and air lift pumps. Pulsometer. Hydraulic Press. Hydraulic rams. Turbine and water wheels. Hydraulic cranes. Hydraulic lifts and hydraulic rivetter. Hydraulic transmission of power, accumulators, etc.

5. THEORY OF MACHINES

1. *Kinematics.*—Definition of a Machine. Machine elements and pairs. Laws of Motion. Constrained Motion. Combinations of pure Mechanism.

Links and chains.—Conic crank chain. Virtual centres—centrodes. Relative linear and angular velocity. Displacement, velocity and acceleration diagrams.

Wheel trains and teeth cams.—Epicyclic gearing,

2. *Effort and Resistance.*—Crank effort and crank effort diagrams. Governors and fly wheels. Balancing of machines. Simple cases of gyrostatic action.

3. *Friction in Mechanisms and Machines.*—Friction in sliding and turning pairs. Friction in pivots and toothed gearing. Brakes and dynamometers.

4. *Miscellaneous Machanism.*—Parallel motion.
5. *Typical Machine tools.*

6. MACHINE DESIGN AND CONSTRUCTION

1. *General.*—Strength and properties of materials used in machines: cast iron, wrought iron, mild steel, alloy steels and antifriction metals.

2. *The Design of simple machine parts.*—Fastenings, bolts, nuts, keys, cotters, rivet and rivetted joints. Jointing materials and joints for prevention of leakage. Pipes and pipe joints. Bearings (forms and proportions of), (1) swivel, (2) thrust, (3) footstep (4) crankshaft, (5) connecting rod, (6) ball and roller. Locomotive axle box. Pedestals, hangers, brackets and wall boxes. Types of lubricators.

3. *The transmission of power.*—Shafts, journals, couplings, pulleys, belts and ropes, toothed gearing.

4. *Design of Engine and boiler details.*—Engine details including connecting rod, crank shaft, bearings, fly-wheels, pistons, slide-valves. Area of steam ports, Zeuner and other valve diagrams. Different types of boilers and accessories including feed pumps, feed-water heaters and condensers.

7. HEAT ENGINES

1. *Thermodynamics.*—Mechanical Theory of Heat. Work done and heat expended in expansion. Cycles of perfect gases and vapours. Expansion of steam, ammonia and carbonic acid, work done and heat required.

2. *Steam and the steam engine.*—Brief history of the steam engine. Properties of saturated and superheated steam. Expansive working. Cylinder condensation. Effect of expansion on dryness. Methods of calculating dryness fraction. Entropy. Entropy-Temperature diagrams.

Simple, compound, triple and multiple expansion engines. Indicating and Indicator diagrams. Cylinder losses. Jackets, superheaters, economisers, condensers.

Steam turbines.—Flow of steam through orifices, design of blades and other details for impulse and reaction turbines.

3. *Internal combustion engines.*—Theory and principles of operation. Construction features of various types, fuel mixtures, carburetion, systems of speed control, ignition, lubrication and cooling.

Suction gas producers and gas engines.

4. *Air and air engines.*—Sterling and other forms of air engines. Air compressors and Refrigerators.

5. *Boilers.*—Cornish, Lancashire, vertical. Setting of Cornish and Lancashire Boilers. Multitubular-Locomotive. Portable. Water tube-Stirling, Babcock and Wilcox. Fittings: Safety valves, steam and water gauges, fusible plugs, stop valves. Economisers and superheaters. Mechanical Stokers, forced draught and smoke prevention. Injectors and Ejectors. Pulsometers.

8. POWER PLANT ENGINEERING

1. *Power Plants.*—This course embraces a study of the methods employed for the transmission and measurement of power in machine shops and factories. Prominence is given to matters of efficiency, advantages and disadvantages and conditions of use of the various forms of transmission. Attention is also given to the design of transmission machinery, and the design, arrangement, and operation of the equipment in power plants.

2. *Shop and Shop Management.*—Lectures on the arrangement and construction of buildings for manufacturing plants; types of buildings, methods of roof construction and of lighting and heating plants; arrangement of machinery and installation of cranes and hoists; the organisation and management of shops; methods of paying wages; systems of cost accounting and shop book-keeping; specifications and contracts; economics of power generation and transmission; costs of maintenance and operation; losses

due to depreciation, interest, etc., and total cost of power per horse power per hour, per year, including interest, rent, depreciation, labour, fuel.

3. *Fuels.*—Calculations on combustion of fuel—such as calorific value of fuel. Given its composition, to find the theoretical quantity of air required and the composition of flue gases. Given the composition of flue gases, to find the excess of air.

Types of fuel—Solid, liquid and gaseous—and their advantages and disadvantages.

Solid fuel—Wood, charcoal and coal.

Manufacture of charcoal.

Formation, nature and source of coal. Classification of coal. Carbonization of coal and manufacture of coke.

Liquid fuel. Formation, nature and source of petroleum. Distillation of petroleum and manufacture of petrol, kerosine oil, etc. Manufacture of Alcohol and shale oil, benzine, Tar oils.

Atomisers suitable for burning oils under boilers.

Gaseous fuel. Natural and blast furnace gases. Manufacture and nature of coal gas, producer gas, water gas, semi-water gas, suction gas, etc. Bye-product recovery plants.

Surface combustion and combustion of gas under boilers. Testing of various types of fuel for their calorific value.

4. *Lubricants and Packing Materials.*—Lubricants.—Classes of lubricants; mineral, vegetable and animal sources. Qualities and properties of lubricants; viscosity and "oiliness." Testing of lubricating oils. Lubricants for different classes of machinery.

Packing Materials.—Carbon packing. Packing for Hydraulic cylinders. Alloys for metallic packing.

9. ELEMENTARY ELECTRICAL ENGINEERING

As for Civil Engineering.

10. MACHINE DRAWING

Drawings of machines from sketches. Preparation of working drawings from actual measurements of details and complete machines.

11. ESTIMATING AND SPECIFICATIONS

Estimating of the cost of simple machines and structures, *e.g.*, cast iron columns, water tanks, roof trusses, etc. Specifications for materials of construction used in the simpler machine parts.

12. ENGINEERING ECONOMICS

As for Civil Engineering.

B. Practical Work

13. MACHINE SHOP PRACTICE

Turning with hand and slide lathes. Screw cutting. Exercises in drilling and boring. Planing. Slotting. Milling and machining.

14. LABORATORY

This course is designed to familiarise the student with the use of instruments used in engineering work and with processes of investigation; also, to give training in accuracy and reliability in securing data and analysing results. and in the conducting and reporting of experimental steam and gas engineering work. The experiments involved include a study of the various auxiliary apparatus used in connection with steam and gas machinery, calibration of instruments, such as thermometers, pressure gauges, steam and gas engine indicators, etc., test of elementary power transmission machinery and friction tests of different types of steam and gas engines.

Steam boiler tests for determining the evaporative efficiency of boilers of different types under conditions of ordinary use; the determination of efficiency of steam and power pumps and steam injectors when operated under various conditions.

Tests of simple, compound and triple expansion engines for the determination of the power developed, the weight of steam used, the interchange of heat between the walls of the cylinder and the contained steam, and the general efficiency of the engine.

Thermal efficiency tests of gas, gasoline and oil engines and automobile motors, tests of gas producers, air compressors and air machinery.

Photography.

Scheme of Examination for the Degree of Bachelor of Engineering

(CIVIL BRANCH)

Serial No.	Subjects	Item of syllabus	No. of papers	Hours for each paper	Marks for written examination	Marks for oral and practical	Marks for records of class work	Minimum for passing	Remarks
*1	Differential and Integral Calculus.	1	1	3	70	...	10	66 per cent. for 1st class 50 per cent. for a pass	Paper common to Civil & Mech. Branches
2	Statics, Dynamics and Hydrostatics.	2	1	3	70	...	10		Do
3	Applied Mechanics and Graphic Statics	3	1 1	2½ 2	80 50	... ...	50		Do
4	Hydraulics and Hydraulic appliances	4	1	3	60	...	15		
5	Building and other forms of construction	5	1	3	80	..	35		
6	Irrigation, Water supply, Sanitary and Municipal Engineering.	6	1	3	120	...	50		

* *N.B.*—Questions should be set mainly in Integral Calculus for the students who may appear in 1921 as they have already been examined in Differential Calculus.

(Civil Branch—*concld.*)

Serial No.	Subjects	Item of syllabus	No. of papers	Hours for each paper	Marks for written examination	Marks for oral and practical	Marks for records of class work	Minimum for passing	Remarks
7	Roads, Bridges and Railways.	7	1	3	100	...	35	{66 per cent. for 1st class {50 per cent. for a pass	
8	Steam and Internal Combustion Engines.	8	1	2	60	...	15		
9	Elementary Electrical Engineering	9	1	2	60	...	15		Common paper to Civil & Mech. Branches.
10	Engineering Economics	10	1	2	40	...	10		Do
11	Surveying	11	1	3	100	75	80		
12	Drawing	12^a	1	4	75	...	100		
13	Estimating and Specifications.	$12b$	1	3	60	..	15		
14	Workshop and Laboratory.	13	...	...	...	...	60		
	Total ...	...	14	..	1,025	75	500		

(MECHANICAL BRANCH)

	Theoretical								
*1	Integral and Differential Calculus	1	1	3	70	...	} 20	{66 per cent. for 1st class {50 per cent. fora pass	
2	Statics and Dynamics and Hydrostatics.	2	1	3	70	...			
3	Applied Mechanics }	3	1	2½	80	...	} 50		
4	Graphic Statics }		1	2	50	...			
5	Hydraulics and Hydraulic Machinery.	4	1	3	60	...	20		
6	Theory of Machines ...	5	1	3	100	...	30		

* *N.B.*—Questions should be set mainly in Integral Calculus for the students who may appear in 1921 as they have already been examined in Differential Calculus.

(Mechanical Branch—*concld.*)

Serial No.	Subjects	Item of syllabus	No. of papers	Hours for each paper	Marks for written examination	Marks for oral and practical	Marks for records of class work	Minimum for passing	Remarks
7	Machine Design and Construction	6	1	3	100	...	60	66 per cent. for 1st class 50 per cent. for a pass	
8	Heat Engines ...	7	1	3	100	...	20		
9	Power Plant Engineering.	8	1	3	80	...	40		
10	Elementary Electrical Engineering	9	1	2	60	...	15		
11	Machine Drawing ...	10	1	4	100	...	100		
12	Estimating and Specifications.	11	1	3	40	...	15		
13	Engineering Economics	12	1	2	40	...	10		
	Practical								
14	Machine shop ...	13	...	...	...	75	60		
15	Laboratory ...	14	...	...	...	75	60		
	Total ...	...	13	...	950	150	500		

There will be common papers in subjects 1, 2, 3, 4, 10 and 13 for both the Civil and Mechanical Branches.

Time-Table for the Final Examination for the B.E. Degree:

(CIVIL AND MECHANICAL)

Day	*Time*	*Subject*	*Max. Marks*
1st	10 a.m. to 1 p.m.	Integral and Differential Calculus.*	70
	2 p.m. to 5 p.m.	Statics, Dynamics and Hydrostatics.*	70
2nd	10 a.m. to 12-30 p.m.	Applied Mechanics*	80
	2 p.m. to 4 p.m.	Graphic Statics* ...	50
3rd	10 a.m. to 1 p.m.	Hydraulics and Hydraulic Appliances.*	60

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* Common to both Civil and Mechanical Engineering.

Day	*Time*	*Subject*	*Max. *Marks*
3rd	2 p.m. to 5 p.m.	*Civil Engineering*—Building and other forms of construction	80
		Mechanical Engineering—Theory of Machines	100
4th		*Holiday*	
5th	10 a.m. to 1 p.m.	*Civil Engineering*—Irrigation, Water-supply, Sanitary and Municipal Engineering	120
		Mechanical Engineering—Machine Design and Construction	100
	2 p.m. to 5 p m.	*Civil Engineering*—Roads, Bridges and Railways	100
		Mechanical Engineering—Heat Engines	100
6th	10 a.m. to 12 noon	*Civil Engineering*—Steam and Internal Combustion Engines	60
	10 a.m to 1 p.m.	*Mechanical Engineering*—Power Plant Engineering	80
	2 p.m. to 4 p.m.	Elementary Electrical Engineering*	60
7th	10 a.m. to 1 p.m.	*Civil Engineering*—Surveying	100
		Mechanical Engineering—Estimating and Specifications	40
8th	10 a.m. to 2 p.m.	*Civil Engineering*—Drawing	75
		Mechanical Engineering—Machine Drawing	100

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* Common to both Civil and Mechanical Engineering.

Day	Time	Subject	Max. Marks
9th	10 a.m. to 12 noon	Engineering Economics*	40
	2 p.m. to 5 p.m.	*Civil Engineering*— Estimating and Specifications	60

Note.—The date and hour of Practical Examinations will be announced after the written examination is over. For records of class work and other details, *vide* Scheme of Examination.

III. ELECTRICAL ENGINEERING

A. Lectures

1. PURE MATHEMATICS

Vide Civil Engineering.

2. APPLIED MATHEMATICS

Vide Civil Engineering.

3. HYDRAULICS

Hydrostatic pressure. Flow of water through orifices, pipes, open channels and over weirs. Hydraulic motors. Principles and practice of water-power development. Theory of impulse wheels and turbines.

4. THERMODYNAMICS

The course embraces a study of thermal capacities, the laws of thermodynamics, the thermodynamics of gases, saturated vapours and superheated steam; the application of the laws of thermodynamics to the steam engine; and a study of steam engine economy by entropy temperature analysis and of the types and efficiencies of gas engines, air compressors and refrigerating machines.

5. MECHANISM

Under this head are studied the principles underlying the action of the elementary combinations of which all machines are composed; the communication of motion by gear wheels, belts, cams, and link-work; the various means of producing definite changes of velocity and the principles of epicyclic trains, parallel and quick return motions.

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* Common to both Civil and Mechanical Engineering.

6. POWER PLANTS

This course consists of a study of fuels, their combustion under steam boilers, and the principles and operation of gas producers. The various types of boilers and boiler room equipment are studied and problems involving the power and efficiency of power plants considered. The common types of steam engines, steam turbines and gas engines are studied in detail as to the principles involved in their construction and operation.

7. ELECTRICAL ENGINEERING

There will be three courses of lectures in electrical engineering. These will cover the fundamental theory of the magnetic, electric, and electro-static circuits and its application to direct current machinery; and the fundamental principles of transmission and distribution of power.

8. ALTERNATING CURRENT THEORY

There will be two courses of lectures in alternating current theory, which will cover theory of alternating current machines and circuits.

9. ELECTRICAL DESIGN

There will be two courses of lectures in electrical design. These will cover fundamental theory of direct and alternating current machinery as applied to design. The work is taken up in the following order:—

1. Electro-magnets for lifting purposes.
2. Direct current generators and motors.
3. Alternating current generators and motors.

4. Rotary convertors, and
5. Transformers.

These are also intended to give practice in actual designing of electrical machinery. Each student is required to make calculation for at least three electrical machines comprised under the following heads :—

1. Polyphase generator or mòtors.
2. Synchronous convertor.
3. Induction motor or transformer.

10. ECONOMICS

Vide Civil Engineering.

B. Practical Work

1. DRAWING AND ESTIMATING

Drawings of machines from sketches; preparation of working drawings from actual measurements of details and complete machines; and design and estimating of simple machines.

3. LABORATORY

There will be two courses in mechanical laboratory practice and three in electrical laboratory work.

Mechanical Laboratory.—This course is designed to familiarize the student with the use of instruments used in engineering work and with processes of investigation; also to give training in accuracy and reliability in securing data and analysing results, and in the conducting and reporting of experimental steam and gas engineering work. The experiments involved include a study of the various auxiliary apparatus used in connection with steam and gas machinery, calibration of instruments such as thermometers, pressure gauges, steam and gas engine indicators, etc., tests of elementary power transmission machinery, and friction tests of different types of steam and gas engines.

Electrical Laboratory.—This includes elementary experiments involving calibrations of instruments, practical testing of dynamos, motors, transformers, incandescent lamps, arc lamps and other forms of electrical apparatus; and experiments with alternating current in circuits containing capacity and self-induction.

Photography.

Certificate Course, Third Year

Conditions of admission

(*Vide* Ordinance 87)

Courses of study—(detailed)

A. *Lectures*—
  1. Elementary Applied Mathematics.
  2. Descriptive Engineering.

B. *Practical work*—
  1. Surveying.
  2. Drawing and estimating.

Elementary Applied Mathematics

Statics.—Forces acting at a point. Representation of a force. Measurement of a force. Resultant of forces. Parallelogram and triangle of forces. Lami's theorem. Polygon of forces. Composition and resolution of forces. Equilibrium of forces impressed on a particle. Parallel forces. Moments. Couples. General conditions of a rigid body acted on by forces in one plane. Centre of gravity. Machines such as the lever, the pulley, systems of pulleys. The inclined plane. The wheel and axle. The common balance. The steel yards and the screw. Friction, its laws. Limiting friction. Angle of friction.

Dynamics.—Fundamental quantities and methods of measurement. Spherometer. Micrometer screw. Vernier speed. Velocity. Triangle and polygon of velocities. Component and resultant velocities. Change of velocity and acceleration. Parallelogram of acceleration. Composition and resolution of velocities. Relative velocity. Angular velocity. Acceleration of falling bodies. Motion under gravity. Motion on a smooth plane. Graphic methods. Laws of motion. Atwood machine. Mass and momentum. Work and energy. Conservation of energy. Circular motion and simple harmonic motion. Pendulum, simple and compound. Impact. Conservation of momentum. Moment of inertia and radius of gyration.

Hydrostatics, Applied Mechanics, including Strength of Materials.—Stress, strain, elasticity and properties of materials used in engineering.

(*a*) Definitions. Intensity of stress. Elasticity. Modulus of elasticity. Elastic limit. Ultimate strength. Resilience. Permanent strength. Fatigue of materials. Factor of safety. Working stress. Behaviour of materials under tension, compression and shear.

(*b*) Design of rivetted joints.

(*c*) Strength of cylinders (thin) subjected to internal pressure.

Application of Statics to Structures

(*a*) Definition of a structure; simple and compound structures.

(*b*) Beams; bending moment and shearing force. Load.

(*c*) Strength of struts and columns.

(*d*) Principle of graphic statics. Application to roofs, bridges and structures, and cranes (jib). Graphic determination of the centre of pressure, and resultant pressure, etc., of surfaces exposed to fluid pressure and their application to the design of dams, etc.

(*e*) Simple shear and torsion. Strength of shafts.

Hydrostatics.—The three states of matter and their general properties. Properties of fluids. Perfect fluid. Gaseous and liquid fluids. Compressibility of fluids. Viscous fluids. Free surface of fluids. Fluid pressure. Pascal's Law of Fluids. Transmission of fluid pressure. Principle of the Hydraulic press. Thrusts due to fluid pressure on plane and curved surface. Centre of pressure and total pressure; their determination graphically (to be done fully in graphical statics). Thrusts due to pressure of fluids on bodies wholy or partially immersed. Principle of Archimedes. Conditions of equilibrium of floating bodies. Syphon and principles involved in the various pumps, such as lift, force, centrifugal pumps and jet pumps, etc.

Hydraulics.—1. Discharge from orifices and notches. Small orifices. Velocity of discharge. Coefficients of velocity. Contraction and discharge. Rectangular orifice and notch. Triangular notch. Velocity of approach. Submerged and partly submerged orifices. Submerged notch.

2. Practical cases. Tank weirs. Drowned weirs. Gauging weirs. Anicuts. Sluices, head, under lock and tank. Modules.

3. Flow in pipes. Fluid friction. Velocity in pipes. Virtual slope. Discharge. Inclination of pipes. Pipes not running full.

4. Flow in channels. Sections for channels. Coefficients. Discharge of channels. Practical data. Channels of minimum border. Falls.

5. Rivers. Cross sections. Measurement of velocity and discharge. Flood discharge from catchment bases. Bends. Regime of rivers.

Hydraulic Machinery.—Pumps, lift pumps and force pumps. Worthington pumps, centrifugal and air lift pumps. Pulsometer

Descriptive Engineering

Mechanical Engineering.—Properties of Steam. Boilers and boiler fittings. General description and management of Cornish, Lancashire vertical locomotives and water-tube boilers, feed water heaters, economizers, superheaters and other accessories and mountings.

Steam engine parts. The cylinder, slide valve, the piston stuffing box, kinds of packing, crank shaft, eccentrics, cross heads guides, connecting rod, bearings, lubrication, cocks and valves, engine accessories, such as condensers, air and circulating pumps, fly-wheel and governors.

Internal combustion engines. (General principles.)

Civil Engineering.—Roads, buildings and bridges.

B. T. Degree Examination

POST-GRADUATE COURSE.

Conditions of admission
(*Vide* Ordinance 62)

Courses of study—(general)

I. Theory—
  1. History of Educational Theory.
  2. Educational Classics.
  3. Educational Psychology.
  4. Methods of Teaching.
  5. School Administration (with School Hygiene).

II. Practice—
  1. Practice Teaching.
  2. Criticism.
  3. Model Lessons.
  4. Black Board.

III. Other Courses—
  Essay on Educational Topics.

IV. Outside the Time-Table—
  1. Physical Exercises.
  2. Series of lectures on special subjects.
    (*a*) Phonetics.
    (*b*) Comparative Education.

(*c*) Physical Education.
(*d*) History of Education in India.
(*e*) Citizenship.

3. Elocution

(Details of Curricula are being drafted.)

M. A. Degree Examinations

Conditions of admission
(*Vide* Ordinance 61)

(*a*) The M. A. Degree Examination in English

Scheme of Examination

The examination shall consist of written and *viva voce* tests. The papers shall be distributed as under :—

Each paper to be of three hours' duration and each paper to carry the marks shown against it—

A.	i.	Essay	150 marks.
	ii.	History of the English language which shall include the elements of phonology and of philology, accidence and syntax	100 marks.
	iii.	History of English literature, including questions on literary criticism and style in prose and verse	100 marks.

B. The Elizabethan Period.

Two papers : one on Shakespeare and the Elizabethan drama, one on prose and poetry. 100 marks each paper.

C. A Special Period: two papers....150 marks each.

One of the following periods—provided that each special period remains the same for not less than three years and that, whenever a change is made, a candidate who has failed may present the period in which he has failed for the examination that immediately follows the change.

Victorian literature.
The literature of the period 1780-1830.
The Age of Pope and Johnson.
The Age of Milton and Dryden.

D. Old English and Middle English or Chaucer.
One paper: 150 marks.

Under A.

There shall be an essay paper giving a wide option. One essay shall be written on a general subject arising out of the history and criticism of English literature.

For the paper on the History of the Language, candidates will be expected to be familiar with such information as is contained in books like—

Bradley: Making of English.
Wyld: Historical Study of the Mother Tongue.
Pearsall Smith: English Language.
H. C. Wyld: A Short History of English.
F. O. Emerson: History of English Language.
Toller: History of English Language.
Otto Jespersen: Growth and Structure of the English Language.

For the third paper, the following books are suggested for reference:—

Saintsbury's "History of English Criticism" and Saintsbury's "Loci Critici," Winchester's "Principles of Literary Criticism," Rannie's "Elements of Style."

Under B.

The first paper shall be on Shakespeare and the Elizabethan drama. Four or five plays of Shakespeare shall be prescribed to serve as a basis for a general knowledge of Shakespeare. Selected dramas of other Elizabethan dramatists shall also be prescribed.

Candidates shall not be asked detailed annotation questions.

General questions relating to Shakespeare's life and to the study and criticism of his works shall be asked.

The second paper shall be on certain prescribed texts in Elizabethan prose and poetry as detailed in the syllabus.

Under C.

There shall be two papers devoted to the Special Period based on prescribed texts and these papers shall include general, literary and critical questions arising from a study of the period.

Under D.

There shall be one paper under either alternative, Old and Middle English or Chaucer. The Old and Middle English paper shall be set on prescribed texts in Old and Middle English as detailed in the syllabus and shall contain both language and general literary and textual questions arising out of the prescribed texts. The paper on Chaucer shall be based on certain prescribed portions of Chaucer as detailed in the syllabus and shall contain both language and general literary and textual questions arising therefrom.

The purpose of the *viva voce* examination shall be only to help the examiners to assign candidates to their proper classes. In no case shall a candidate as a result of the *viva voce* be placed in a lower class than that to which he is entitled on his written papers.

Time-table for the M.A. Degree Examination in English

Day	*Time*	*Subject*	*Max. Marks*
1st	10 a.m. to 1 p.m.	Essay	150
	2 p.m. to 5 p.m.	History of the English Language	100

Day	*Time*	*Subject*	*Max. Marks*
2nd	10 a.m. to 1 p.m.	History of English Literature	100
	2 p.m. to 5 p.m.	Elizabethan Drama	100
3rd	10 a.m to 1 p.m.	Do Prose and Poetry	100
	2 p.m. to 5 p.m.	Special Period: I Paper	150
4th		*Holiday*	
5th	10 a.m. to 1 p.m.	Do II paper	150
	2 p.m. to 5 p.m.	Old English and Middle English or Chaucer.	150

N.B.—The date for the *viva voce* examination will be announced to the candidates after the written examination is over.

Scheme of classes and percentages for the M.A. Degree Examination in English

1. The degree to be given in three classes.

2. The minimum percentages of marks required to be—

First class ...	 60	per cent. and above.
Second class	 50	,, ,,
Third class	 40	,, ,,

(*b*) The M.A. Degree Examination in History, Economics and Political Science

Courses of Study

At the written examination each candidate shall be required to select.—

(1) *Two* from the following:—

(*a*) A general survey of History of India;

Or

A general survey of European History—
Mediæval or Modern.

(*b*) A general survey of Economics
(*c*) A general survey of Political Science

AND

(2) *four* from the following:—

(*a*) Indian History—Special subject
(*b*) Indian History do
(*c*) Economics do
(*d*) Economics do
(*e*) Political Science do
(*f*) Political Science do
(*g*) European History do
(*h*) The Popes and the Hohenstaufens do
(*i*) European Colonial History and Administration do
(*j*) Local Government and Finance do
(*k*) Indian Epigraphy do
(*l*) History of China and Japan do
(*m*) History of a Selected Language or Literature do
(*n*) Numismatics do
(*o*) Ethnology do

Each candidate shall also be required to write an essay on a subject to be selected from a group of alternatives.

Special Subjects for the M.A. Degree Examination of 1921 in History, Economics and Political Science

Indian History (1)

Economic, social and political conditions of India as described by Greek and Roman writers.

Or

History of Vijayanagar.

Indian History (2)

India as described by the Chinese Pilgrims.

Or

The Sikhs.

Economics (1)

Indian Currency and Banking.

Economics (2)

The Co-operative Movement.

Political Science (1)

Modern Federalism.

Political Science (2)

Political Thought in the 19th Century.

European History

Age of Louis XIV.

The Popes and the Hohenstaufens.

Scheme of Examination for the M.A. Degree in History, Economics, and Political Science

At the written examination, each candidate shall be required to select—

(1) *two* from the following :—

(*a*) A General Survey of History of India. *Two* papers (3 hours each),

Or

A General Survey of European History—Mediaeval or Modern. *Two* papers (3 hours each).

(*b*) A General Survey of Economics. *Two* papers (3 hours each).

(*c*) A General Survey of Political Science. *Two* papers (3 hours each),

and

(2) *four* from the following :—

(*a*) Indian History	Spl. Subject.	1 paper (3 hrs.)
(*b*) Indian History	do	do
(*c*) Economics	do	do
(*d*) Economics	do	do
(*e*) Political Science	do	do
(*f*) Political Science	do	do
(*g*) European History	do	do
(*h*) The Popes and the Hohenstaufens	do	do
(*i*) European Colonial History and Administration	do	do
(*j*) Local Government and Finance	do	do
(*k*) Indian Epigraphy	do	do
(*l*) History of China and Japan	do	do
(*m*) History of a Selected Languag or Literature	do	do
(*n*) Numismatics	do	do
(*o*) Ethnology	do	do
(3) Essay	....	do

Time-table for the M.A. Degree Examination in History, Economics, and Political Science

Day	*Time*	*Subject*	*Max. Marks*
	GENERAL SUBJECTS :—		
1st	10 a.m. to 1 p.m.	Indian History General I	 100
		Mediæval European History I	... 100
		Modern European History I	 100

Day	*Time*	*Subject*	*Max. Marks*
1st	2 p.m. to 5 p.m.	Indian History General II	100
		Mediæval European History II	100
		Modern European History II	100
2nd	10 a.m. to 1 p.m.	Economics General I	100
	2 p.m. to 5 p.m.	Do II	100
3rd	10 a.m. to 1 p.m.	Political Science General I	100
	2 p.m. to 5 p.m.	Political Science General II	100
4th		*Holiday*	
	SPECIAL SUBJECTS:—		
5th	10 a.m. to 1 p.m.	Indian History (Greek Writers and India)	150
	2 p.m. to 5 p.m.	Indian History (Chinese Travellers in India)	150
6th	10 a.m. to 1 p.m.	Political Science (Modern Federalism)	150
	2 p.m. to 5 p.m.	Political Science (English Political Thought in the 19th Century)	150
7th	10 a.m. to 1 p.m.	Economics (The Co-operative Movement).	150
	2 p.m. to 5 p.m.	Economics (Indian Currency and Banking)	150
8th	10 a.m. to 1 p.m.	European History (Age of Louis XIV)	150
	2 p.m. to 5 p.m.	The Popes and the Hohenstaufens	150
	COMPULSORY SUBJECT:—		
9th	10 a.m. to 1 p m.	Essay	100

Scheme of classes, percentages, etc., for the M.A. Degree Examination in History, Economics, and Pol. Science

(1) The Degree to be given in three classes.

(2) The minimum percentages of marks required to be—

First class	....	60 per cent.
Second class	....	50 „
Third class	....	40 „

(3) Separate Minima to be required as under—

(i) General subjects		30 per cent.
(ii) Special subjects		30 „
(iii) Essay	...	30 „

(4) The Maxima to be—

(i) Each General paper	100
(ii) Each Special paper	150
(iii) Essay	100

(c) The M.A. Degree Examination in Philosophy

Courses of study

(1) History of European Philosophy, Ancient and Modern.

(2) Essay.

(3) Any *two* of the following subjects:—

Logic, Psychology, Ethics, Political Philosophy, Indian Philosophy and Metaphysics.

Scheme for the M.A. Degree Examination in Philosophy

1. History of Philosophy, Ancient and Modern—
   One paper (three hours).
2. Essay—
   One paper (three hours).
3. *Any* **two** *of the following* :—
   Logic—
   One general paper of an advanced character (three hours).
   One paper on Indian Logic (three hours).

Psychology—

One general paper of an advanced character (three hours).

One paper with special reference to Physiological Psychology and Social Psychology (three hours).

Ethics—

One general paper of an advanced character (three hours).

One paper with special reference to Indian Ethics (three hours).

Political Philosophy—

One general paper of an advanced character (three hours).

One paper on the History of Political Thought (three hours).

Indian Philosophy—

One paper on the History of Indian Philosophy (three hours).

One paper on a prescribed school of Indian Philosophy (three hours).

Metaphysics—

One paper on Kant's Critique of Pure Reason (three hours).

One paper on General Philosophy as approached in a prescribed recent work (three hours).

Time-table for the M.A. Degree Examination in Philosophy

Day	*Time*	*Subject*	*Max. Marks*
	COMPULSORY GROUP :—		
1st	10 a.m. to 1 p.m.	History of Philosophy	100
	2 p.m. to 5 p.m.	Essay	100
	OPTIONAL GROUP :—		
2nd	10 a.m. to 1 p.m.	Optional Group I: Indian Philosophy I	100

Day	*Time*	*Subject*	*Max. Marks*
2nd	2 p.m. to 5 p.m.	Optional Group I: Indian Philosophy II	100
3rd	10 a.m. to 1 p.m.	Optional Group II: Metaphysics (Kant)	100
	2 p.m. to 5 p.m.	do (Bergson)	100

Scheme of classes, percentages etc., for the M.A. Degree Examination in Philosophy

(*a*) The Degree to be given in three classes.

(*b*) The minimum percentages of marks required to be:—

First Class	....	....	60 per cent.
Second Class	....	....	50 ,,
Third Class	....	....	40 ,,

(*c*) The maximum number of marks for each paper to be 100.

(*d*) Each paper to be of three hours' duration.

(*e*) The minimum in each of the two optional groups to be 30 per cent. and the minimum in the two compulsory papers combined, *viz.*, History of Philosophy and Essay also to be 30 per cent.

(*d*) The M.A. Degree Examination in Sanskrit

Courses of study

The course shall extend over two years and shall consist of—

A. A *general* part relating to the study of the classical language and literature, and

B. A *special* part relating to the study of—

(*a*) Vedas, *or*

(*b*) Sastras, *at the option of the student.*

The *general* part shall comprise—

(i) Detailed study of prescribed books under Prose, Poetry and Drama.

N.B.—The student is required to possess a sufficient knowledge of Dramaturgy and Prakrit.

(ii) Sanskrit Grammar (as in *Siddhanta-Kaumudi*, excluding *Taddhita*, *Saishika*, *Unadi*, *Svara* and *Vaidika*

Prakaranas) with the elements of Indo-Germanic Philology.

(iii) Poetics, as in *Kavyaprakasa* or any similar work.

(iv) Composition in Sanskrit.

The *special* part shall comprise—

(*a*) Vedas—

(i) Vedic Grammar, Philology and Exegesis.

(ii) Detailed study of prescribed books representing the various stages of Vedic literature.

(iii) A critical enquiry into the growth and value of Vedic literature in general (including the *Vedangas*).

(iv) Unprepared Translation.

(*b*) Sastras—

(i) Essentials of *Tarka* and *Mimamsa*.

(ii) Detailed study of prescribed books relating to one or more Sastras.

(iii) A critical enquiry into the growth and value of Sastra literature in general.

(iv) Unprepared Translation.

Scheme for the M.A. Degree Examination in Sanskrit

A. GENERAL PART

1.	Classical Prose and Poetry	One paper of 3 hours.
2.	Drama	do
3.	Grammar with the Elements of Indo-Germanic Philology	do
4.	Poetics	do
5.	Sanskrit Composition	do

B. SPECIAL PART

1.	(*a*) Vedic Grammar, Philology and Exegesis	do
	Or	
	(*b*) Essentials of Tarka and Mimamsa	do
2.	Selected Subject—Prescribed Books	do
3.	Do Prescribed Books	do
4.	Do General	do
5.	Unprepared Translation	do

Time-table for the M.A. Degree Examination in Sanskrit

Day	*Time*	*Subject*	*Max. Marks*
	GENERAL PART:—		
1st	10 a.m. to 1 p.m.	Classical Prose and Poetry	100
	2 p.m. to 5 p.m.	Drama	100
2nd	10 a.m. to 1 p.m.	Grammar with the Elements of Indo-Germanic Philology	100
	2 p.m. to 5 p.m.	Poetics	100
3rd	10 a.m. to 1 p.m.	Sanskrit Composition	100
	SPECIAL PART:—		
4th	10 a.m. to 1 p.m.	*Veda:* Vedic Grammar, Philology and Exegesis *Sastra:* Essentials of *Tarka* and *Mimamsa*	100
	2 p.m. to 5 p.m.	*Veda:* Prescribed Books: First Paper *Sastra:* do do	100
5th	10 a.m. to 1 p.m.	*Veda:* do Second Paper *Sastra:* do do	100
	2 p.m. to 5 p.m.	*Veda:* do General Paper *Sastra:* do do	100
6th	10 a.m. to 1 p.m.	*Veda:* Unprepared Translation *Sastra:* do do	100

Scheme of classes, and percentages for the M.A. Degree Examination in Sanskrit

(1) The Degree to be given in three classes.

(2) 100 marks to be assigned to each of the papers for the examination.

(3) The minimum for passing to be 30 per cent. in each of the two parts (general and special) and 40 per cent. on the whole for a pass in the third class, 50 per cent. for a pass in the second class, and 60 per cent. for a pass in the first class.

Prescribed Text-books and Books recommended for Study

University Entrance Examination, 1921

A. ENGLISH

Poetry :—

Rossetti—The King's Tragedy.
Either Macmillan's or Oxford Press Edition.
Ferguson—Conary,
Longer Narrative Poems, Loane. (Macmillan).

Prose :—

Rider Haggard—Lysbeth (abridged), (Longmans).

Non-detailed study :—

Andrew Lang. Tales of Troy and Greece (Longmans).

B. SECOND LANGUAGE

(*a*) *Kannada*

Poetry—

Kumaravyasa Bharata, Adiparva, Sandhis 17 and 18.

Prose—

1. Abalasacharitra Ratnamala. Lives of Bhandaru Achammamba, Mysore Maharani Laxammani, Rani Bhavani, Ahalya Bai Holkar (Bangalore Press, Mysore Road, Bangalore City).
2. The Adventures of Telemachus, an adaptation in Kannada, Part I. by M. Venkatakrishnaiya (K. V. V. Press, Mysore).

(*b*) *Telugu*

Poetry—*Classical.* Andhra Bharatamu, Adi Parvamu, Canto IV, 1st 109 stanzas.

Modern—Haravali by Venkataparavateswara Kavulu, Vol. I. up to page 54 (Andhrapracharini Mudrakshara Sala Nidaduvolu).

Drama—Swapna Vasavadattamu by Chilakamriti Lakshmi Narasimha Rao (Rajahmundry), First two acts.

Prose—Andhrula Charitramu by Chilakuri Virabhadra Rao, Vol. III. First six chapters. (Ithihasa Tharangini Granthamala Series, Aravilli, Krishna District).

(c) *Tamil*

Poetry—

1. Villiputtur Alvar Bharatam, Krishnantudusarukkam, Stanzas 1—99.
2. Naladiyar, Chapters 20-24.

Prose—

Balaramayanam by A. Madhavaiyar, Chapters 21 to the end (pp. 95-220).

Grammar—

Ilakkanachchurukkam, by Arumuga Navalar, "Solladhikaram" (pp. 92-188).

(d) *Sanskrit*

1. Panchatantra: Book iii (Bombay Sanskrit Series).
2. Kumarasambhava: Canto vi.

(e) *Hindustani*

Prose and poetry—

Guldastai Adab, by Pehr Mandhar Lal (can be had at Allahabad or Lucknow at any of the booksellers).

(f) *Persian*

Prose and poetry—

Muntakhabate-Farsi, Part 4.

(g) *French*

Les plus jolis contes de Fees, by J. Lazare (Hachette & Co., 18. King William Street, Charing Cross, London).

C. OPTIONAL SUBJECTS

(*e*) *History*

History of England: Gardiner's "Students' History of England."

Books recommended for additional reading—

Green: Short History of the English People (new edition).

Lingard: History of England (one volume edition).

(*f*) *Economics*

"Recent Economic History of England."

either

Chapters 13 and 15 to 19 in Townsend Warner's "Land-Marks in English Industrial History,"

or

Chapters 17 to 29 in Innes' 'England's Industrial Development."

Additional books which may be consulted—

1. Cunningham: Growth of English Industry and Commerce, Vol. II., Part II (Cambridge University Press).
2. Cressy: An Outline of Industrial History (Macmillan).
3. Perris: The Industrial History of Modern England (Kegan Paul).
4. Toynbee: Industrial Revolution (Longmans).

(*h*) *Sanskrit*

1. Kadambari-sangraha, pp. 1-68. (Sadananda-Nilaya Press, Madras).
2. Svapnavasavadatta (with Sanskrit *chaya* substituted for *prakrit* passages). (Trivandrum Sanskrit Series).

(*i*) *Persian*

Prose—

Savanihi Umeri-i-Hazin.

Poetry—

Laali-i-Manzuma.

B. A. Degree Examination, 1921-23

I. ENGLISH *

Degree Examination of 1921

First year, 1918-19

Shakespeare: Julius Cæsar.
Goldsmith: The Deserted Village.
Coleridge: Ancient Mariner.
Macaulay's Biographies: Goldsmith, Johnson. (A. & C. Black).

For non-detailed study—
In Feudal Times: Tappan (Harrap).

Second and third years, 1919-20-21

For detailed study—
Shakespeare: King Lear.
Ben Jonson: Every Man in His Humour.
Milton: Samson Agonistes.
Gray: The Progress of Poesy, The Bard, The Descent of Odin, The Elegy.
The Tennyson Epoch: Edited by J. C. Stobart.
Epochs of English Literature: Arnold.
The following selections:—
Tennyson, Browning, Clough, Henley, Bridges, Newbolt.
Selections from Dryden: Ed. Strunk. (Bell & Sons.)
Selections from Newman: 1-8 (inclusive). (Longmans.)
De Quincey: Joan of Arc, The English Mail Coach. (Heath's English Classics.)
Bacon's Essays—Of Truth, Of Revenge, Of Adversity, Of Simulation and Dissimulation, Of

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* The following books are prescribed under Ordinance 68 (*b*) and (*c*) I. English (*b*) and (*c*), page 116 of the Calendar:—
Alden: An Introduction to the Study of Poetry.
Hudson: An Introduction to the Study of Literature.
Worsfold: Judgment in Literature.

Marriage and Single Life, Of Envy, Of Great Place, Of Goodness and Goodness of Nature, Of Nobility, Of Atheism, Of Superstition, Of Empire, Of Counsel, Of Wisdom for a Man's Self, Of Friendship, Of the True Greatness of Kingdoms and Estates, Of Discourse, Of Studies, Of Praise, Of Anger.

(The Edition of Bacon's Essays in Heath's English Classics is recommended).

For non-detailed study—

Marvin: Progress and History (Oxford Press.)
Thackeray: Vanity Fair.
Lockhart: Life of Scott (Everyman's Library.)

Degree Examination of 1922

First year, 1919-20

For detailed study—

Shakespeare: Richard II.
Milton: Lycidas. L'Allegro, Il Penseroso.
The Sonnets.
Goldsmith: The Vicar of Wakefield.

For non-detailed study—

Selections from R. L. Stevenson (Longmans).

UNIVERSITY.

Second and third years, 1920-21-22

Shakespeare: King Lear, The Tempest.
Tennyson Epoch,
Ed. J. C. Stobart
Epochs of English Literature (Arnold).

The following selections:—

Tennyson Clough Bridges
Browning Henley Newbolt

Wordsworth,
Selections by C. L. Thomson,
Cambridge Press.

Pope: Rape of the Lock.

English Prose from Bacon to Hardy (Breadus & Gordon). (Oxford Press.)

The following selections :—

Bacon
Browne
Milton
Swift
Burke
Arnold

Carlyle : Essay on Burns.

Non-detailed study :—

Scott : The Bride of Lammermoor.
Gissing : The Private Papers of Henry Ryecroft (Constable.)
Marvin : The Century of Hope (Oxford Press.)

Degree Examination of 1923

First year, 1920-21

Shakespeare : Henry IV, Part I.
Milton : Paradise Lost, Book II.
Sir Roger de Coverley Papers,
Ed : W. H. Hudson (Heath & Co.)

Non-detailed study :—

The Story of Dr. Johnson,
S. C. Roberts,
Cambridge University Press.

Second and third years, 1921-22-23
(to be prescribed)

II SECOND LANGUAGE

(*a*) KANNADA

Degree Examination of 1921

First year, 1918-19

1. Jaimini Bharata : Sandhis 22-24.
2. Mysore Maharaja Charithram, by Kavitilaka Pandit Aiya Sastri, Asvasas 5-8.
3. Purna Kala, by Srimati Tirumalamba (Sati Hitaishini Series.)

Second and third years, 1919-20-21

1. Jagannatha Vijaya, Asvasas 1-3.
2. Gadayuddham, Asvasas 6-10.
3. Mitravinda Govindam.
4. Adbhuta Ramayanam (Kalanidhi Series).

Degree Examination of 1922

First year, 1919-20

1. Maharaja Charithram, by Kavitilaka Pandit Aiya Sastri, Asvasas 9-12.
2. Jaimini Bharata, Sandhis 12 to 14, (inclusive) edited by Pandit Karibasappa Sastri.
3. Mudra Manjusha, Chapters 9 to 18, both inclusive.

Second and third years, 1920-21-22

1. Pampa Ramayana, Asvasas 2 and 3 (Edited by Karnataka Parishat.)
2. Veni Samhara Nataka, by Jayarayacharya.
3. Kabbigara Kava, whole. (Kalanidhi Series.)
4. Sakuntala Nataka—Navina Tike (Kalanidhi Series.)

Degree Examination of 1923

First year, 1920-21

1. Jaimini Bharata (edited by P. R. Karibasava Sastri), Sandhis 25 and 26.
2. Padmini, by K. Laxminarayana Bhatta (Hanuman & Co, Mysore. Madhuravani Series No. 23)
3. Karnataka Pancha Tantram—*Mitrabheda*, by Pandit Sitarama Sastri (Karnataka Granthamala Series No. 83) pages 1 to 61.

Second and third years, 1921-22-23

(to be prescribed)

(*b*) TELUGU

Degree Examination of 1921

First year, 1918-19

Amukta Malyada, 1st Canto.
Drama—
Naganandamu, by V. Venkataraya Sastrulu (published by Vijnana Chandrika Book Depot, Mount Road, Madras.)
Non-detailed prose—
Sakshi, by P. Lakshminarasimha Ravu (published by Vidyanilaya Press, Rajahmundry). The 1st 15 essays.

Second and third years, 1919-20-21

Nannachoda's Kumarasambhavamu, Canto 4.
Amukta Malyada, Canto I.
Thikkanna's Bharatamu, Udyaga Parvamu, Canto I.
Drama—
Sakuntala: translated by Viresalingam Pantulu.
Prose—
Vikramadeva Charitramu, by Tirupati Venkatesvara Kavulu.

Degree Examination of 1922

First year, 1919-20

Drama—
Uttara Rama Charitra, by Malladi Suryanarayana Sastry, (Author, Ceded District College, Anantapur.)
Poetry—
Kumarasambhavamu, by Nanne Choda, Canto 5; (published by M. Ramakrishna Cavi, Oriental Library, Madras.)
Non-detailed study—
Jaimini Bharatamu, in prose (published by the Telugu Academy, Madras.)

Second and third years, 1920-21-22

Drama—

Prachanda Chanakyamu, by Penuganti Laxminarasimhamu.

Poetry—

1. Kalapurnodayamu, Canto 2.
2. Uhaganamu and Purvaprema, by Abburi Ramkrisna Rao (Andhra Patrika Press, Madras.)
3. Lalita, by Rayaprolu Subba Rao (Chandrika Press, Guntur.)
4. Parijatapaharanamu, by Nandi Thimmanna, Canto 1.

Prose—

1. Karna Samrajyamu, by Chilakuri Virabhadra Rao (Author, Rajahmundry.)
2. Sivaji Charitram, by K. V. Lakshman Rao (Vijnana Chandrika Office, Madras.)

Degree Examination of 1923

First year, 1920-21

Poetry, *Classical*—

Manucharitramu, by Allasani Peddanamatya. From the "Kathaprarambhamu" in Canto I to the end of Canto II.

Modern—

Snehalata Devi, by Rayaprolu Subba Rao (Abhinava Kavita Mandali Series).

Drama—

Malavikagnimitramu, by K. Viresalingam Pantulu.

Prose—

Non-detailed study—Dasakumara Charitramu, by Sanjiva Raya Sastri.

Second and third years, 1921-22-23

(to be prescribed)

(c) TAMIL

Degree Examination of 1921

First year, 1918-19

Poetry—

1. Villiputturalvar Bharatam—Drona Parvam, "Fourteenth Day War."
2. Nanmanikkadigai, Stanzas 1 to 50.

Prose—

1. History of Seringapatam, by Pandit Narayanaswami Pillai.
2. Alwar Charitram, by Pandit Sadagopa Ramanujachariar.

Grammar—

Ilakkana Churukkam, by Arumuga Navalar, "Punariyal."

Non-detailed study—

Life of Empress Victoria, by Pandit K. T. Shanmugavelu Pillai.

Second year, 1919-20

Poetry—

Kambaramayanam—Ayodhyakandam, "Mandirappadalam" and Mandaraichoozhchippadalam."

Prose—

Lives of Sir T. Muthusami Iyer and Dewan Rangacharlu, by T. A. Swaminatha Iyer.

Grammar—

Nannul Kandigai Urai, by Arumuga Navalar. "Padaviyal" and "Uyirittuppunarial."

Third year, 1920-21

Poetry—

1. Kambaramayanam—Sundarakandam.
   (*a*) "Urukkattuppadalam."
   (*b*) "Chudamanippadalam."
2. Purananuru, Stanzas 1 to 50.

Prose—

Tiruvalluvar, by Chennakesavaraya Mudaliar.

Grammar—

Nannul Kandigai Urai, by Arumuga Navalar. "Poduviyal."

Degree Examination of 1922

First year, 1919-20

Poetry—

1. Kuchelopakkianam, by Devaraja Pillai. "Kuchelar Melkadaladainda Adhyayam." Stanzas 44 to 197.
2. Neethinerivilakkam, Stanzas 1 to 50.

Prose—

Arumporul Thirattu, by Pandit Gopalakrishnan. Part 3, pages 1-154.

Grammar—

Ilakkanachchurukkam: Cholladikaram, by Arumuga Navalar.

Non-detailed study—

Suguna Sundari Charitram, by Vedanayagam Pillai.

Second year, 1920-21

Poetry—

1. Tiruvarangakkalambagam, by Pillaipperumaliengar.
2. Kandapuranam—Tiruvilaiattuppadalam.

Prose—

Buddhacharitram, Bauddha Dharmam and Bauddha Sangam, by Pandit Swaminatha Iyer.

Grammar—

Nannul Kandigai Urai. by Arumuga Navalar. From Poduppayiram to Uyirirruppunariyal.

Third year, 1921-22

Poetry—

1. Kambaramayanam: Sundarakandam, "Pasappadalam and Pinivittuppadalam."
2. Purananuru, Stanzas 51 to 100.

Prose—

Manimekalaikkadaichurukkam, by Pandit Swaminatha Iyer.

Grammar—

Nannul Kandigai Urai, by Arumuga Navalar. From "Meyyeerruppunariyal" to "Peyariyal."

Degree Examination of 1923

First year, 1920-21

Poetry—

1. Villiputtur Alvar Bharatam, Irajasuyachchurukkam.
2. Nitinerivilakkam, Stanzas 51 to the end.

Prose—

Udayanan Charitai, by V. M. Gopalakrishnamachariar.

Grammar—

Ilakkanachchurukkam: Todarmoli adhikaram.

Non-detailed study—

Pratapamudaliar-sarittiram, by Vedanayagam Pillai.

Second and third years, 1921-22-23
(to be prescribed)

(*d*) SANSKRIT

Degree Examination of 1921

First year, 1918-19

Sakuntalam: Acts i-iv (inclusive).

Second and third years, 1919-20-21

1. Meghasandesa: Edited by K. B. Pathak (Aryabhushana Press, Poona).
2. Kadambari Sangraha: pp. 1-68 (Sadananda Nilaya Press, Madras).

Degree Examination of 1922

First year, 1919-20

Malavikagnimitra: (with Sanskrit *chaya* substituted for *prakrit* passages).

Second and third years, 1920-21-22

1. Kadambari-Sangraha: Pages 1-53. (Sadananda Nilaya Press, Madras).
2. Kiratarjuniya: Cantos iv-vi (inclusive).

Degree Examination of 1923

First year, 1920-21

Ratnavali (with Sanskrit *chaya* substituted for *prakrit* passages).

Second and third years, 1921-22-23

1. Kadambari-Sangraha: pp. 68-139 (Sadananda Nilaya Press, Madras).
2. Kiratarjuniya: Cantos: iv-vi (inclusive).

(*e*) HINDUSTANI

Degree Examination of 1921

First year, 1918-19

Prose—
Jangal men Mangal (the whole).
Poetry—
Sanam Khana-e-Ishq, 1st 150 pages.

Second and third years, 1919-20-21

Prose—
Nairang-e-Khiyal.
Lectures by Dr. Nazeer Ahmed.
Poetry—
Dewan-e-Galib.
Marasi-e-Anees, Volume I (1st 4 marasi).

Degree Examination of 1922

First year, 1919-20

Prose—
Durgesh Nandni.
Poetry—
Diwane' Atish (From Raddif Bai to the end of Radif Noon).

Second and third years, 1920-21-22

Prose—

Inkhilabul Umam.

Poetry—

1. Kulliyathe' Southa. From "Raddif Alif" to "Raddif Rai" (inclusive).
2. Kulliathè Galib. From the beginning to the end of "Khsaed."
3. Khasaede-Zouq (whole).

Degree Examination of 1923

First year, 1920-21

*Poetry—

Mukhtar Ashaar. Jild I. (Selections from Divane Naseer and Souda.)

*Prose—

Makatibati Shible. Jild I (Vol. I).

Second and third years, 1921-22-23

(to be prescribed)

(*f*) PERSIAN

Degree Examination of 1921

First year, 1918-19

Prose—

Insha-e-Madhu Ram.

Poetry—

Bustan, Chapters IV and V.

Second and third years, 1919-20-21

Prose—

Anwar-e-Suhaili. Chapters I and II.

Alamgir Nama, Volume I (up to Alauddin).

Poetry—

Yusuf Zulaikha of Jami.

Dewan-e-Hafiz.

(Radeefs of Re Xe Sun and Sheen.)

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* These books can be had at "The School Books and Literature Society," Madras, and at any book depot, Aligarh.

Degree Examination of 1922

First year, 1919-20

Prose—

Tareekhe Jehan, 150 pages.
Kushai Nadari.

Poetry—

Divane Gani.

Second and third years, 1920-21-22

Prose—

Eqbalnumai Jahangiri (up to the 19th year of his reign from his accession).

Poetry—

1. Rubaiyathe Umar Khiyam—up to the end of "Raddif Dal."
2. Diwane' Rowdaki (whole).

Degree Examination of 1923

First year, 1920-21

Prose—

Haji Baba Isphehani. (1st part or 1st volume).

Poetry—

Thufatul Aharari Jami.

Second and third years, 1921-22-23

(to be prescribed)

(*g*) FRENCH

Degree Examination of 1921

First year, 1918-19

1. Grammar: Bertenshaw, Part I.
2. Pour Charmer Nos petits. (Harrap.)
3. Easy Unseen Translation.

Second year, 1919-20

1. Grammar: Bertenshaw, Parts I and II complete.
2. Erkmann Chatrian. "Histoire d'un Conscrit de 1813." (Cambridge University Press.)

3. Brehat "Une main d'enfant." (Siepmann's Series, Macmillan.)
4. Essay and Translation. (Narration francaise et Théme.)

Third year, 1920-21

1. Macmillan's Progressive French Course. Part II.
2. W. M. Daniels "Choix de poesies faciles." (Harrap.)
3. A. Daudet. "Tartarian de Tarascon." (Siepmann's Series, Macmillan.)
4. Essay and Translation. (Narration francaise et Théme, Advanced.)

Degree Examination of 1922

First year, 1919-20

1. Longmans Modern French Course. Part I.
2. Perrault. "Contes de Fees." (Siepmann's Series, Macmillan.)
3. Easy unseen Translation.

Second year, 1920-21

1. Longmans Modern French Course. Part II.
2. Marguerite Ninet. "Un petit voyage a Paris." (Blackie & Sons.)
3. Erkmann Chatrian. "Le Tresor du vieu Seigneur." (Siepmann's Series.)
4. Essay and Translation. (Narration francaise et Théme.)

Third year, 1921-22

1. Macmillan's Progressive French Course. Part II.
2. P. Mérimée. "Columba." (Siepmann's Series, Macmillan.)
3. Louis A. Barbé. . "Longer poems for recitation." (Blackie and Sons.)
4. Essay and Translation. (Narration francaise et Théme, Advanced.)

Degree Examination of 1923

First year, 1920-21

En France by C. Fontaine (Heath's Modern Language Series.)

Second and third years, 1921-22-23

(to be prescribed)

III. OPTIONAL SUBJECTS

A. NATURAL SCIENCE

1. *Botany*—

Thoday: Botany, a text-book for senior students.
Fyson: Botany of India.
K. Rangachari: Manual of Botany for India.
Strasburger: Text-book of Botany.

2. *Zoology*—

Shipley and Macbride: Zoology.
Parker and Haswell: Text-book of Zoology.
Sedgwick: Students' Text-book of Zoology.

3. *Geology*—

Bourne, G. C.: Comparative Anatomy.
Dana: Text-book of Mineralogy.
Williams: Crystallography.
Hatch: Text-book of Petrology.
Hatch: Text-book of Sedimentary Rocks.
Harker: Petrology for Students.
Cole: Aids in Practical Geology.
Geikie: Structural and Field Geology.
Judd: Student's Lyall.
Vredenburg: Summary of Geology of India.
Holland: Chapter on Geology in "Imperial Gazetteer of India."
Wood: Palæontology.

B. (*a*) HISTORY

First year

	Subjects	*Books recommended for study*
1.	History of Greece	Oman : History of Greece.
2.	History of Rome	Pelham: Outlines of Roman History.

Additional reading

Bury : History of Greece.
How and Leigh : History of Rome.
Shuckburgh : Do
Heitland : Outlines of History of Rome.

Second year

	Subjects	*Books recommended for study*
1.	History of India to 1200 A.D.	V. A. Smith: History of Early India. K. V. Rangaswami Iyengar: Pre-Musalman India. Rapson : Ancient India.
2.	History of Europe : (476—1453).	Six Ages of Europe (Methuen).

Additional reading

Macdonell : History of Sanskrit Literature.
"Gazetteer of India" (the Historical Introduction).
Rhys Davids : Buddhist India.
S. Krishnaswami Iyengar : Ancient India.
Emerton : Mediæval Europe.
Hill : History of European Diplomacy, Vols. I and II.
Bryce : Holy Roman Empire.

Third year

	Subjects	*Books recommended for study*
1.	History of India (1200—1910)	Lane-Poole : Mediæval India.

	Innes: British India. Lyall: Rise of British Dominion in India.
2. History of Europe (1453—1878).	"Six Ages of Europe" (Methuen).

Additional reading

Keene: History of India.
"Cambridge Modern History" (Chapter on India).
Robert: History of India.
Bryce: Holy Roman Empire.
Acton: Lectures on Modern History.

(*b*) ECONOMICS AND POLITICAL SCIENCE

First year

Subject	*Book recommended for study*
1. The British Constitution.	Marriott: English Political Institutions.

Additional reading

Courtney: The Working Constitution of the United Kingdom.
Low: Governance of England.
Lowell: Government of England, Vol I.

2. Indian Economic Conditions.	Banerjea: Study of Indian Economics.

Additional reading

Morrison: Economic Transition in India.
Moreland: Elementary Economics for Indian Students.

Second year

Subjects	*Books recommended for study*
1. Economics of Industry.	Ely and Wicker: Elementary Economics. (Revised by L. L. Price.)
2. Comparative Politics.	Sidgwick: Development of European Polity. Leacock: Elements of Political Science.

Additional reading

Carver: Distribution of Wealth.
Taussig: Principles of Economics.
Marshall: Elements of Economics.
Wilson: The State.
Dicey: Law and Custom of the Constitution.
A. Rangaswamy Iyengar: The Indian Constitution.

Third year

Subjects	*Books recommended for study*
1. Currency, Banking, International Trade, and Public Finance.	Ely and Wicker: Elementary Economics.
2. Analytical and Deductive Politics.	Sidgwick: Elements of Politics.

Additional reading

Withers: Meaning of Money and Money Changing.
Keynes: Indian Currency and Finance.
Taussig: Principles of Economics.
Dicey: Law and Custom of the Constitution.
Pollock: History of the Science of Politics.
Dunning: History of Political Theories.

(*c*) PHILOSOPHY: GROUP I

First Year

(1) *Logic*

Book recommended—

Boyce Gibson: The Problem of Logic.

Books to be consulted—

1. Joseph: Introduction to Logic.
2. Creighton: An Introductory Logic, Part III.

(2) *Plato and Aristotle*

Books recommended—

1. Plato: Republic.
2. Zeller: Outlines of Greek Philosophy.

Book to be consulted:—

Stewart: Plato's Doctrine of Ideas.

Second and third years

(1) *Theory of Knowledge*

Books recommended—

1. Bosanquet: Essentials of Logic.
2. Joachim: The Nature of Truth.

Books to be consulted—

1. James: The Meaning of Truth.
2. Hobhouse: Theory of Knowledge.

(2) *History of Modern Philosophy*

Book recommended—

Schwegler: History of Philosophy.

Books to be consulted—

1. Cushman: A Beginner's History of Philosophy, Volume II.
2. Höffding: History of Modern Philosophy.

(3) *Prescribed Classic*

Leibnitz: The Monadology, (1920-21), (Latta's Edition).

Descartes: Meditations, (1921-22).

Berkeley: Principles of Human Knowledge, (1922-23).

Kant: Metaphysics of Ethics, (1923-24), translated by Abbot: published by Messrs. Longmans, Green and Co.

(4) *A Second Philosophical Classic in the case of candidates who take up both the groups*

Hume: Inquiry (1920-21), (Extracts).

From 1921-22, in lieu of a second Philosophical Classic in the case of candidates who take up both the groups:

Elements of Metaphysics.

Book recommended—

Mackenzie: Outlines of Metaphysics.

Books to be consulted—

1. Mackenzie: Elements of Constructive Philosophy.
2. A. E. Taylor: Elements of Metaphysics.

(5) *Outlines of Indian Philosophy*

Book recommended—

Max Müller: Six Systems of Indian Philosophy.

Books to be consulted—

1. Sarva Darsana Sangraha, (translated by Cowell and Gough).
2. Garbe: The Philosophy of Ancient India.
3. Deussen: The Philosophy of the Upanishads.

(*d*) PHILOSOPHY: GROUP II

First year

(1) *Ethics*

Books recommended—

1. Mackenzie: Manual of Ethics.
2. Dewey and Tufts: Ethics, Part I.
3. Mezes: Ethics, chapter on The Growth of Conscience.

Books to be consulted—

1. Paulsen: System of Ethics.
2. Muirhead: Elements of Ethics.

(2) *Psychology*

Book recommended—

1. Angell: Psychology.

Books to be consulted—

1. Stout: Manual of Psychology.
2. James: Text-book of Psychology.
3. Lickley: The Nervous System.
4. McDougall: Physiological Psychology.

Second and third years

(1) *History of Ethics*

Book recommended—

Rogers: History of Ethics.

Books to be consulted—

1. Sidgwick: History of Ethics.
2. Wundt: Ethical Systems.

(2) *History of Modern Philosophy*
Same as in Group I.

(3) *Political Philosophy*
Books recommended—
1. Green : Principles of Political Obligation.
2. Pollock: Introduction to the Science of Politics.

Books to be consulted—
1. Bosanquet : The Philosophical Theory of the State.
2. Willoughby : The Nature of the State.
3. Sidgwick : Elements of Politics, Part I.

(4) *Ethico-Political Classic*
Bentham : Fragment on Government, Edited by Montague. (1920-21), (Oxford University Press).
Mill : Representative Government, (1921-22).
Rousseau : Social Contract, (1922-23).
Hobbes : Leviathan, (1923-24), Parts I and II.

(*e*) SANSKRIT

Degree Examination of 1921

First year, 1918-19

1. Aitareya Brahmana : Chapters 37-40 (inclusive).
2. Siddhanta Kaumudi : *Samjna*, *Paribhasha*, *Karaka* and *Samasa Prakaranas*.

Second and third years, 1919-20-21

(*a*) Detailed study—
1. Pieces 1-15 in the Vedic Reader, by Prof. Macdonell.
2. Apastamba Dharma-Sutra : Prasna I (Mysore Edition).
3. Dandi : Kavyadarsa.
4. Karikavali (text only).

(*b*) Non-detailed study—
  1. Mahabharata: Sakuntalopakhyana.
  2. Ramayana: Ayodhyakanda: first 20 Cantos.
  3. Bhasa: Pratima-Nataka.

Degree Examination of 1922

GROUP I

First year, 1919-20

(*a*) 1. Sisupalavadha, Cantos xiii and xiv.
  2. Harshacharita, Chapter vi.
  3. Manu-Smriti, Chapter iii.

Second and third years, 1920-21-22

(*b*) 1. Uttararama-charita.
  2. Ratnavali.
(*c*) Kavyadarsa.
(*d*) Siddhanta Kaumudi, *Samjna*, *Paribhasha* and *Karaka Prakaranas.*

GROUP II

First year, 1919-20

(*a*) 1. Aitareya-Brahmana, Chapter 33.
  2. Vasishtha-Dharma-Sutra, Chapters 1-14 (inclusive).
  3. Asvalayana-Grihya-Sutra, Adhyaya i.

Second and third years, 1920-21-22

(*a*) 1. Macdonell: Vedic Reader, Selections 1-15 (inclusive).
  2. Taittiriya-Aranyaka, Adhyaya ii.
(*b*) Recommended for study—
  Dr. Gune: Introduction to Comparative Philology. (Poona).
(*c*) Recommended for study—
  Macdonell: Vedic Grammar for students.

GROUP III

First year, 1919-20

(*a*) 1. Chandogya-Upanishad: Chapter vi.
2. Bhagavadgita: Chapters i-vi (inclusive).
(*b*) Tarakasangraha, with Dipika.

Second and third years, 1920-21-22

(*c*) 1. Vedanta-Sara of Sadananda.
2. Samkhya-Karika.
3. Sarvadarsanasangraha: Bauddha-Darsana.

Degree Examination of 1923

GROUP I

First year, 1920-21

(*a*) 1. Sisupalavadha: Cantos xiii and xiv.
2. Bana: Kadambari—pages 186 to 209 in the Purva-bhaga according to K. P. Parab's edition 1916, Nirnayasagara Press.
3. Manusmriti: Ch. iii.

Second and third years, 1921-22-23

(*b*) 1. Malavikagnimitra.
2. Uttararamacharitra.
(*c*) Vamana: Kavyalankara-Sutra with Vritti.
(*d*) Siddhanta-Kaumudi: *Samjna, Paribhasha and Karaka Prakaranas.*

GROUP II

First year, 1920-21

(*a*) 1. Aitareya-Brahmana, Chapter 33.
2. Vasishtha-Dharma-Sutra, Chapters 1-14 (inclusive).
3. Asvalayana-Grihya-Sutra, Adhyaya i.

Second and third years, 1921-22-23

(*a*) 1. Macdonell—Vedic Reader, Selections 1-15 (inclusive).
2. Taittiriya-Aranyaka, Adhyaya ii.

(*b*) Recommended for study—
Dr. Gune: Introduction to Comparative Philology. (Poona.)
(*c*) Recommended for study—
Macdonell: Vedic Grammar for students.

GROUP III

First year, 1920-21

(*a*) 1. Chandogyopanishad: Ch. vi.
2. Bhagavadgita: Ch. vii-xii (inclusive).
3. Tarka-sangraha with Dipika.

Second and third years, 1921-22-23

(*b*) 1. Yatindramatadipika.
2. Samkhya-Karika.
3. Sarvadarsanasangraha: Bauddha-Darsana.

(*f*) PERSIAN

Degree Examination of 1921

First year, 1918-19

Prose—
Baharisthan-e-Jami, first 70 pages (Newalkishore Press).
Nizam-ul-mulk, first 102 pages.
Poetry—
Laila Majnoon Hathifi.
Bo-e-Gul Shibli.

Second and third years, 1919-20-21

Prose—
Se Nasr-e Zuhuri, first Nasr.
Abul Fazl, 3rd Daftar.
Safar namah-e-Shah-e-Iran, first half.
Poetry—
Inthekhab-e-Dewan-e-Saib (up to the Radeef of Dal).

Dewan-e-Hafiz (the Radeef of Dal).
Thohfath-ul-Ahrar-e-Jami-Mikhalas, 1 to 9.
Qusaid-e-Urfi, (first five Qasidas).

Degree Examination of 1922

First year, 1919-20

Prose—
Tareekhe Ale' Burmak, 1st half.

Poetry—
Divane Ahmed Jam.

Second and third years, 1920-21-22

Prose—
Abul Fazle, Dattar II.
Seh Nasre' Zahoori, Nasiri II.

Poetry—
1. Khasaede Khaqani, First Five Khasidas.
2. Shah Nama, From Accession of Kiumurs to the birth of Rustum.
3. Diwane Hafiz (whole of Raddif Alif).

Degree Examination of 1923

First year, 1920-21

Poetry .... Shah Nama, portion relating to Suhrab and Rustum (from Dastan-e-Sohrab to Dastani-e-Siyavoush) Dewani Hakim Sanai up to the Raddif of Dal.

Prose .... Tajut Tawareq., Volume I, Chapters 1 to 4.

Second and third years, 1921-22-23

(to be prescribed)

B.Sc. Degree Examination, 1921-22

A. ENGLISH

Degree Examination of 1921

First year, 1918-19

(Same as for B.A. first year, 1918-19).

Second and third years, 1919-20-21

For detailed study—

Shakespeare	King Lear.
Huxley	Lectures and Essays. (Macmillan's Popular Sixpenny Series.)

For non-detailed study—

Church	The Trial and Death of Socrates (Golden Treasury Series, Macmillan).
Mitchell	Life of Huxley (Methuen's Shilling Library).
Dickens	The Tale of two Cities.

Third year, French

[Since there is no separate examination in French, it is unnecessary to prescribe text-books. Students should be so taught as to be able to translate with some facility such books as :—

"French Readings in Science": Payen-Payne (Blackie and Son)].

Degree Examination of 1922

First year, 1919-20

(Same as for B.A. first year, 1919-20).

Second and third years, 1920-21-22

Detailed study—

Shakespeare .... King John.
Sir Roger De Coverley Papers
Ed. W. H. Hudson,
(Heath's English Classics).

Non-detailed study—

Dickens	... The Pickwick Papers.
R. L. Stevenson	.... Treasure Island.
Sisson	....

Select English Speeches of the Nineteenth Century.

Speeches by Cobden, Bright, Gladstone, Froude. (Oxford Press.)

Third year, French

(*Vide* page 228)

B. SECOND LANGUAGE

First year, 1919-20

(Same as for B.A. first year, 1919-20).

Second year, 1920-21

(*a*) KANNADA

1. Surasena Charitra, by Basavappa Sastri (General Agency, Mysore).

2. Bhava Chintaratna, Sandhis 7, 8 and 9, by Gubbi Mallanarya (Karnataka Kavya Kalanidhi Series, Mysore).

3. Mudra Manjusha, 1 to 8 Asayas (C.L.S. Book Depot, Mysore).

(*b*) TELUGU

Poetry—Sri Kalahasti Mahatmyamu, by Dhurjati Kavi, Canto III.

Prose—Asoka Charitramu, by B. Lakshmikanta Rao (Andhra Bhashabhivardhini Series).

(*c*) TAMIL

Poetry—

1. Tiruvarangakkalambagam, by Pillaipperumal-iengar.
2. Kural with Parimelalagar's commentary, Chapters 20-24.

Prose—

Buddha Charittram, Baudha Dharmam, Baudha Sangam, by Mahamahopadhyaya Pandit Swaminatha Iyer.

Grammar—

Nannul Kandigai Urai, by Arumuga Navalar, from Poduppayiram to Uyirirruppunariyal.

(*d*) SANSKRIT

Kadambari Sangraha, pages 1-53. (Sadananda Nilaya Press, Madras.)

(*e*) HINDUSTANI

Prose—

Alberuni.

Poetry—

Diwane Zouq, (the whole except Khasidas).

(*f*) PERSIAN

Prose—

Baharistane Jami.

Poetry—

Diwane Gani.

SANSKRIT

First year, 1920-21

Ratnavali (with Sanskrit *chaya* substituted for *prakrit* passages).

Second year, 1921-22

Kadambari Sangraha, pages 141-177 (Sadananda-Nilaya Press, Madras).

B.Com. Degree Examination, 1921-22

Degree Examination of 1921

A. ENGLISH

First year, 1918-19

(Same as for B.A. first year, 1918-19).

Second and third years, 1919-20-21

Mitchell: Life of Huxley. (Methuen's Shilling Library.)

Marvin: The Living past. (Oxford Press.)
R. L. Stevenson: Kidnapped.

Degree Examination of 1922

First year, 1919-20

(Same as for B.A. first year, 1919-20).

Second and third years, 1920-21-22

Sir Roger De Coverly Papers, Ed: W. H. Hudson (Heath's English Classics).
R. L. Stevenson .... Kidnapped.
Shakespeare .... Julius Cæsar.

B. SECOND LANGUAGE

First year, 1919-20

(Same as for B.A. first year).

M.A. Degree Examination in English, 1921

The Elizabethan Period

First Paper—

Shakespeare .... Richard II, Much Ado About Nothing, Hamlet, The Tempest.
Kyd .... The Spanish Tragedy.
Marlowe .... Edward II.
Ben Jonson .... Every Man in His Humour.
Webster .... The Duchess of Malfi.

Second Paper—

Spenser .... Faerie Queene, Book II; The Shepherd's Kalendar.
Anthology of the Age of Shakespeare, Ed. W. T. Young.
Ascham .... Scholemaster.
Sidney .... Apologie for Poetrie.

Hakluyt	Select Narratives in the Voyages of English Seamen, (First Series), Ed. E. J. Payne.
Bacon	New Atlantis.

Special Period: Victorian Literature

Carlyle	Biographies of "Goethe," "Johnson," "Burns" and "Scott."
Newman	The Rise and Progress of Universities.
Arnold	Essays in Criticism, (Second Series).
Hardy	Far from the Madding Crowd.
Thackeray	Vanity Fair.
Browning	Pippa Passes.
Tennyson	In Memoriam.
Swinburne	Atlanta in Calydon.
Arnold	Elegiac Poems.

Old English and Middle English or Chaucer

Beowulf. LL	1-1251.
Sweet	Anglo-Saxon Reader: 8th Edition, I, II, IV. V, VIII, X, XVI.
Morris	Specimens of Early English, Part I.
	II. The State of England Under Stephen's Reign.
	IX. The Ancren Riwle.
	XVI. The Owl and the Nightingale.
Morris and Skeat	Specimens of Early English, Part II.
	IV. Specimens of Lyric Poetry.

XIV. Sir John Mandeville.
XV. William Langland—Piers the Plowman, (Prologue and Passus I).

Chaucer

The Prologue.
The Knights' Tale.
The House of Fame.
The Parlement of Foules.

M.A. Degree Examination in Sanskrit, 1921-22

Degree Examination of 1921

A. GENERAL PART

(i) Books prescribed for study—

1. Subandhu: Vasavadatta.
2. Sri Harsha: Naishadha-Charita: Cantos iv-vi (inclusive).
3. Mrichchakatika.
4. Mudrarakshasa.

(ii) Elements of Indo-Germanic Philology—

(*a*) Recommended for study—

1. Delbruck: Introduction to the study of Language.
2. Tucker: Introduction to the Natural History of Language.
3. Bloomfield: Introduction to the study of Language.
4. Oertel: Lectures on the study of Language.
5. Uhlenbeck: Sanskrit Phonetics.

(*b*) Recommended for consultation—

Brugmann: Elements of Indo-Germanic Comparative Grammar.

(iii) 1. Kavyaprakasa: Ullasas i-vi (inclusive).
2. Kuvalayananda.

B. SPECIAL PART

(*a*) *Vedas*—

(i) Vedic Grammar, Philology and Exegesis.

1. Prescribed for study—
Siddhanta-Kaumudi: *Svara* and *Vaidika Prakaranas.*
Yaska: Nirukta: Naighantavakanda: Ch. 2.
Sayana: Introduction to the Rigveda Bhashya.
Laugakshi Bhaskara: Arthasangraha.
2. Recommended for study—
Macdonell: Vedic Grammar.

(ii) Prescribed for study—

1. Rigveda: Second Ashtaka: Suktas 1-20.
2. Atharvaveda: Sixth Kanda: Suktas 1-20.
3. Aitareya-Brahmana: Ch: 33-40 (inclusive).
4. Asvalayana-Grihya-Sutra.
5. Gautama-Dharma-Sutra.

(iii) Recommended for study—

1. Barth: Religions of India.
2. Bloomfield: Religion of the Veda.
3. Bloomfield: Atharvaveda (Ency: of Indo-Aryan Research).
4. Macdonell: Vedic Mythology (Ency: of Indo-Aryan Research).
5. Arnold: Vedic Metre.
6. MaxMüller: Ancient Sanskrit Literature.
7. Oldenberg: Ancient India (Eng. Translation).

(*b*) *Sastras*—

(i) Essentials of Tarka and Mimamsa—
Prescribed for study—

1. Muktavali.
2. Laugakshi-Bhaskara: Arthasangraha.

(ii) Prescribed for study—

1. Samkhya-Karika.
2. Yoga-Sutras.
3. Kanada: Sutras.

4. Gautama: Nyaya-Sutra with the Bhashya of Vatsyayana.
5. Kusumanjali: Stabakas, 1 and 2.

(iii) Recommended for study—

1. Sarvadarsanasangraha.
2. MaxMüller: Six Systems of Philosophy.
3. Davies: Hindu Philosophy.
4. Keith: The Samkhya System.
5. Chatterji: Hindu Realism.
6. Brajendra Nath Seal: Positive Sciences of the Ancient Hindus.
7. Deussen: Elements of Metaphysics.

Degree Examination of 1922

A. GENERAL PART

(i) Books prescribed for study—

1. Subandhu: Vasavadatta.
2. Sriharsha: Naishadha-Charita: Cantos iv-vi (inclusive).
3. Malatimadhava.
4. Vikramorvasiya.

(ii) Elements of Indo-Germanic Philology—

(*a*) Recommended for study—

1. Delbruk: Introduction to the study of Language.
2. Tucker: Introduction to the Natural History of Language.
3. Bloomfield: Introduction to the study of Language.
4. Oertel: Lectures on the study of Language.
5. Uhlenbeck: Sanskrit Phonetics.

(*b*) Recommended for consultation—

Brugmann: Elements of Indo-Germanic Comparative Grammar.

(iii) 1. Kavyaprakasa: Ullasas i-vi.

2. Kuvalayananda: from the beginning to the end of Lalitalamkara.

B. SPECIAL PART

(*a*) *Vedas*—

(i) Vedic Grammar, Philology and Exegesis.

1. Prescribed for study—
   Siddanta-Kaumudi : *Svara* and *Vaidika Prakaranas.*
   Yaska : Nirukta : Naighantavakanda : Ch. 2.
   Sayana: Introduction to the Rigveda Bhashya.
   Laugakshi-Bhaskara : Artha-Sangraha.
2. Recommended for study—
   Macdonell : Vedic Grammar.

(ii) Prescribed for study—

1. Rigveda : Second Ashtaka : Suktas 1-20.
2. Atharvaveda : Fifteenth Kanda.
3. Aitareya Brahmana : Ch. 1-5 (inclusive).
4. Asvalayana-Grihya-Sutra.
5. Gautama : Dharma Sutra.

(iii) Recommended for study—

1. Barth : Religions of India.
2. Bloomfield : Religion of the Veda.
3. Bloomfield : Atharvaveda (Ency : of Indo-Aryan Research).
4. Macdonell : Vedic Mythology (Ency : of Indo-Aryan Research).
5. Arnold : Vedic Metre.
6. MaxMüller : Ancient Sanskrit Literature.
7. Oldenberg: Ancient India (Eng.Translation).

(*b*) *Sastras*—

(i) Essentials of Tarka and Mimamsa—
Prescribed for study—

1. Muktavali.
2. Laugakshi-Bhaskara : Artha-Sangraha.

(ii) Prescribed for study—

1. Samkhya-Karika.
2. Yoga-Sutras.
3. Kanada : Sutras.

4. Gautama: Nyaya Sutras with Vatsyayana's Bhashya. (Chapters I and II only).
5. Kusumanjali: Stabakas 1 and 2.

(iii) Recommended for study—

1. Sarvadarsanasangraha.
2. MaxMüller: Six systems of Philosophy.
3. Davies: Hindu Philosophy.
4. Keith: The Samkhya System.
5. Chatterji: Hindu Realism.
6. Brajendra Nath Seal: Positive Sciences of the Ancient Hindus.
7. Deussen: Elements of Metaphysics.

List of books in Philosophy for the M.A. Examination

I. HISTORY OF PHILOSOPHY

Ancient and Modern

Books recommended—

1. Burnet's Greek Philosophy from Thales to Plato.
2. Erdmann's History of Philosophy: Ancient and Mediaeval (Pages 1 to 9).
3. Adamson's Development of Greek Philosophy.
4. Adamson's Development of Modern Philosophy.
5. Höffding's History of Modern Philosophy.
6. Rand's Modern Classical Philosophers.

Books to be consulted—

Zeller's volumes on Greek Philosophy.

II. LOGIC

(a) *European Logic*—

Books recommended—

1. Bosanquet's Logic.
2. Dewey's Studies in Logical Theory (i-iv).
3. Mackintosh's The Problem of Knowledge.
4. Joachim's Nature of Truth.

Books to be consulted—

1. Sigwart's Logic.
2. Lotze's Logic.
3. Bradley's Principles of Logic.

4. Lossky's The Intuitive Basis of Knowledge (Macmillan & Co.).

(*b*) *Indian Logic*—

Books recommended—

1. Annambhatta's Tarka Sangraha, with conventions (Bombay edition), by Bodas and Athalye.
2. Thompson's Laws of Thought (Chapters on Indian Logic).
3. Seal's Positive Sciences of the Ancient Hindus (Chapter on Methodology).

Books to be consulted—

1. Suzuki's Hindu Logic.
2. Mediaeval Indian Logic by Mahamahopadhyaya Satis Chandra Vidyabhushana.

III. PSYCHOLOGY

(*a*) *I Paper*—

Books recommended—

1. James's Principles of Psychology.
2. Stout's Analytic Psychology.
3. Ward's Psychological Principles.

Books to be consulted—

1. McDougall's Body and Mind.
2. Myer's Survival of Human Personality.
3. Jastrow's The Subconscious.
4. Meyer's Text-book of Experimental Psychology.

(*b*) *II Paper*—

Books recommended—

1. Ladd's Elements of Physiological Psychology
2. McDougall's Physiological Psychology.
3. Lickley's The Nervous Systems.
4. Shand's Foundations of Character.
5. McDougall's Social Psychology.
6. Le Bon's Psychology of Crowd.

Books to be consulted—

1. Wundt's Physiological Psychology.
2. Ribot's Psychology of the Emotions.

3. Thorndike's Animal Intelligence.
4. W. Trotter's Instincts of the Herd in Peace and War.
5. Conway's The Crowd in Peace and War.

IV. ETHICS

(*a*) (*European Ethics*) *I Paper*—

Books recommended—

1. Green's Prolegomena to Ethics (Except Book 1).
2. Kant's Theory of Ethics by Abbot.

   or

   Kant's Critique of the Practical Reason and Kant's Metaphysics of Morals.
3. G. E. Moore's Principia Ethica.
4. Alexander's Moral Order and Progress,

   or

   Leslie Stephen's Science of Ethics,

   or

   Spencer's Data of Ethics.
5. Westermarck's The Origin and Development of Moral Ideas (Selections).

Books to be consulted—

1. Sidgwick's Methods of Ethics.
2. Taylor's The Problem of Conduct.
3. Croce's Philosophy of the Practical.
4. Mill's Utilitarianism.
5. Aristotle's Nicomachean Ethics.

(*b*) *Indian Ethics*—(Books not yet recommended).

V. POLITICAL PHILOSOPHY

(*a*) *I Paper*—

Books recommended—

1. Green on Political Obligation.
2. Bosanquet's The Philosophical Theory of the State.
3. Ritchie's Natural Rights.
4. Spencer's Man *versus* State.
5. G. Wallas's Human Nature in Politics.

6. G. Wallas's The Great Society.
7. Russell's Principles of Social Reconstruction.

Books to be consulted—

1. Aristotle's Politics.
2. Seeley's Introduction to Political Science.
3. Maine's Ancient Law.
4. Bagehot's Physics and Politics.
5. Mill's Representative Government.

(*b*) *II Paper*—

Books recommended—

1. Dunning's Political Theories, Ancient, Mediaeval and Modern.
2. Barker's Political Thought, from *Spencer* to *To-day*.

Books to be consulted—

1. Hobbes' Leviathan.
2. Locke's Essay on Civil Government.
3. Rousseau's Social Contract.
4. Aristotle's Politics.
5. Plato's Republic.

Other original works necessary.

VI. METAPHYSICS

(*a*) *Kant's Critique of Pure Reason*—

Books recommended—

1. Watson's Kant.
2. Stirling's Text-book of Kant.
3. Norman Smith's Commentary to Kant's Critique of Pure Reason.

Books to be consulted—

1. Caird's Critical Philosophy.
2. Kant's Theory of Knowledge by Pritchard.
3. Kant's Prolegomena to Every Future Metaphysic.

(*b*) *III Paper*—

1919-20 }
1920-21 } Bergson's Creative Evolution.

1921-22 }
1922-23 } Croce's Logic.

1923-24 }
1924-25 } Bradley's Appearance and Reality (Part I and Part II omitting Chapters XVIII to XXIII [both inclusive]).

VII. INDIAN PHILOSOPHY

I Paper: History of Indian Philosophy.

Books recommended—

1. Bloomfield's Religion of the Vedas.
2. Deussen's Philosophy of the Upanishads.
3. Oldenberg's Buddha.
4. Jaini's Outlines of Jainism.
5. Chatterji's Hindu Realism.
6. Davies' Hindu Philosophy.
7. Max Müller's Six Systems of Indian Philosophy.

Books to be consulted—

1. A. B. Keith's The Samkhya System.
2. Deussen's System of the Vedanta.
3. Max Müller's The Upanishads.
4. Gough's Philosophy of the Upanishads.
5. Telang's Bhagavad Gita.
6. Bhandarker's Vaishnavism and Shaivism.
7. Cowell and Gough's Sarvadarsanasangraha.
8. Seal's Positive Sciences of the Ancient Hindus.

II Paper—

1920-21 : Advaitism.

1921-22 }
1922-23 } The Samkhya System.

1923-24 }
1924-25 } Advaitism.